THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

[REGISTERED AS A NEWSPAPER.]

VOL. XXIV. No. 603.] LONDON, DECEMBER 1, 1874. [26TH YEAR.] Price 6d.

RAMSAY'S NEWCASTLE CANNEL
COAL. Analysis—10,600 cubic feet of gas per ton of coal; 26-candle gas; 13¼ cwt. coke per ton of coal.
The London Exhibition in 1851 was lighted with gas made from Ramsay's Cannel.
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RAMSAY'S FIRE-CLAY ARTICLES.
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WORKS: BRIXHAM, TORBAY.
These Paints are now used in 100 Country Gas-Works, and by all (but one) of the London Gas Companies, on Gasholders, Scrubbers, Purifiers, &c. They will cover tar effectually. Also used by the Admiralty, War Office, Railway Companies, Founders, &c.
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WELL-SEASONED PLANKS.
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Were the only parties to whom a PRIZE MEDAL was awarded at the GREAT EXHIBITION of 1851, for "GAS-RETORTS and OTHER OBJECTS in FIRE-CLAY," and they were also awarded at the INTERNATIONAL EXHIBITION of 1862, the PRIZE MEDAL for "GAS-RETORTS, FIRE-BRICKS, &c., for EXCELLENCE of QUALITY."
J. C. and Co. have been for many years the most extensive Manufacturers of Fire-Clay Retorts and Fire-Bricks in the Kingdom. Orders for Fire-Clay Retorts of all shapes and dimensions, and to fit any shaped Mouthpiece, Fire-Bricks, and every other article in Fire-Clay, are promptly executed at their Works as above.
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J. R. and Co. make all kinds of Tubes and Fittings for Gas, Steam, and Water; Gun-Metal Cocks, Stocks, and Dies; Galvanized Tubes and High-Pressure Tubes, &c.
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GAS, HOUSE, and STEAM COAL, and CANNEL;
Also for every sort of Gas Apparatus and Fire Goods.
MESSRS. ROMANS, being lessees of several Gas-Works, have their Cannels tested in the ordinary working process, thus securing for their customers a guarantee beyond mere laboratory experiments.
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Presented by Her Majesty's Government to the French Government;
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DRY GAS-METERS,
Warranted to Measure correctly, and not to vary.
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AND EVERY DESCRIPTION OF FIRE-CLAY GOODS.

N.B.—A Stock of 15 and 16 in. CIRCULAR RETORTS always on hand. Other kinds made to order on short Notice.

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PATENT IMPROVED SEAL

FOR

GAS HYDRAULIC MAINS.

SAVES COAL, RETORTS, FUEL, LABOUR, TIME, SPACE, AND CAPITAL.

PREVENTS STOPPAGE OF ASCENSION-PIPES, DEPOSITION OF CARBON IN RETORTS, THICKENING OF TAR IN HYDRAULIC MAIN.

GIVES MORE GAS PER TON OF COAL, WITH HIGHER ILLUMINATING POWER, SATISFACTION, AND PROFIT TO SHAREHOLDERS AND MANAGERS.

IS STRONG, SIMPLE, EASILY FIXED AND WORKED, AND THOROUGHLY EFFICIENT AT ALL TIMES.

TESTIMONIAL.

Gas-Works, Guildford, Sept. 15, 1874.

GENTLEMEN,—The five retorts fitted with your Patent Moveable Seal for Dip-Pipes, on June 30, have been in constant use since that date, and have worked in a most satisfactory manner.

These Retorts are still quite clean and free from carbon, whilst others not so fitted, after being at work eight weeks, required scurfing, having a deposit of carbon 2 inches in thickness on the inside.

I also find a slight increase in the yield of gas per ton of coal carbonized, although your Patent Seals are fitted to but one-fifth of the Retorts now at work.

As your statements respecting your apparatus are fully confirmed by the results obtained in practical working, I should wish you at once to fix one to each of the ovens at these works, that I may obtain all possible advantage during the coming winter.

Yours truly,

Messrs. Caffall, Thomas, and Co., Limited, 28, Gracechurch Street, E.C. JOS. SHAW, Manager.

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The only Prize Medal awarded for TUBES & FITTINGS.

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IMPROVED WROUGHT-IRON RETORT-LIDS, CROSS-BARS, & SCREWS;

AND GAS APPARATUS OF EVERY DESCRIPTION.

SOLE MANUFACTURERS OF LIVESEY'S PATENT GASHOLDER MAN-LID,

By use of which Man-lid, inlet and outlet pipes can be examined and cleansed without loss of gas in crown of holder, or ingress of atmospheric air.

ROOFS, GIRDERS, BRIDGES, AND BOILERS OF ALL KINDS.

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FOR GAS, STEAM, AND WATER;

Also **ORDINARY WELDED WROUGHT-IRON TUBES** and **FITTINGS,**

FOR GAS, STEAM, & WATER, EITHER BLACK, GALVANIZED, OR ENAMELLED.

CORE BARS FOR IRONFOUNDERS, STOCKS, TAPS, AND DIES, IRON COCKS, &c.

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The superiority of the material supplied by this Company is generally recognized, and it is now in use in nearly all the London and most of the large Provincial Gas-Works.

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IMPROVED VENTILATING SUN-LIGHTS

WITH TALC REFLECTORS AND SELF-ACTING VALVES TO PREVENT DOWN-DRAUGHT;

VENTILATING GLOBE LIGHTS for DINING-ROOMS, LIBRARIES, &c.

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Of every size and shape, and of the best quality; also of White and Coloured GLAZED BRICKS, SANITARY PIPES, &c., &c.

The F. I. Co. have the exclusive right to make and sell Fraser's Patent "Ribbed" Gas-Retorts in Fire-Clay.

In order to meet the constantly increasing demand for their Gas-Retorts, the F. I. Co. have recently made such an addition to their premises as will enable them to execute expeditiously the largest home or foreign orders.

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FIRE-BRICKS, TILES, BLOCKS, AND CHIMNEY-TOPS.

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Beg to call the attention of MANAGERS and DIRECTORS of GAS COMPANIES to the following letter which they have lately received.

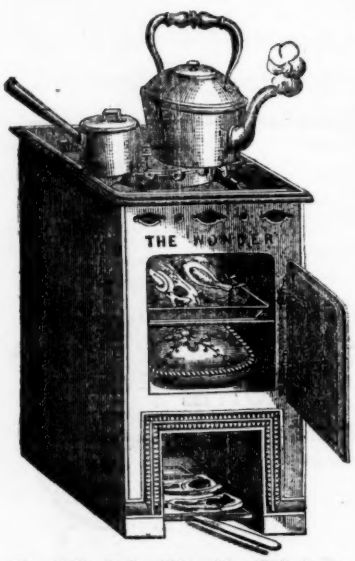
COPY OF LETTER RECEIVED FROM MAGNUS OHREN, Esq.

Crystal Palace District Gas Company, Lower Sydenham, S.E.

To Messrs. John Wright and Co., Essex Works, Birmingham.

Dear Sirs,—In reply to your inquiries, I am glad to state that the use of GAS COOKING AND HEATING STOVES has been a complete success here. We have several hundred in use in our districts. We also find it advantageous to let out Stoves at a small rental. We have now 275 Stoves at rent.

The Stoves you make I can with confidence recommend, having so many in use, and giving satisfaction. I need scarcely point out to you the advantage to Gas Companies to recommend the use of Gas Stoves to their Gas Consumers, even where they do not supply them on sale or rent, as the use of Gas Stoves brings day consumption, and thus the Company make a profit by day as well as by night.—I am, dear sirs, yours faithfully, MAGNUS OHREN.



Size, 25½ in. high; 14 in. wide; 12½ in. back to front.

Price 50s., complete with Pan and Gridiron.

GAS HEATING STOVES

(TERRA COTTA AND IRON).

THE CHEERFUL STOVE.

COOKING STOVES.

BREAKFAST COOKERS.

BATHS HEATED by GAS

GAS STOVES

For Boiling, Broiling, Preserving, Heating Flat Irons, and for all other Domestic Purposes.

Gas Companies and the Trade who have not our Illustrated Catalogue are respectfully requested to apply for same.

A LIBERAL DISCOUNT to the TRADE.

No. 4003.

THE CHEERFUL GAS STOVE, with Copper Reflector,

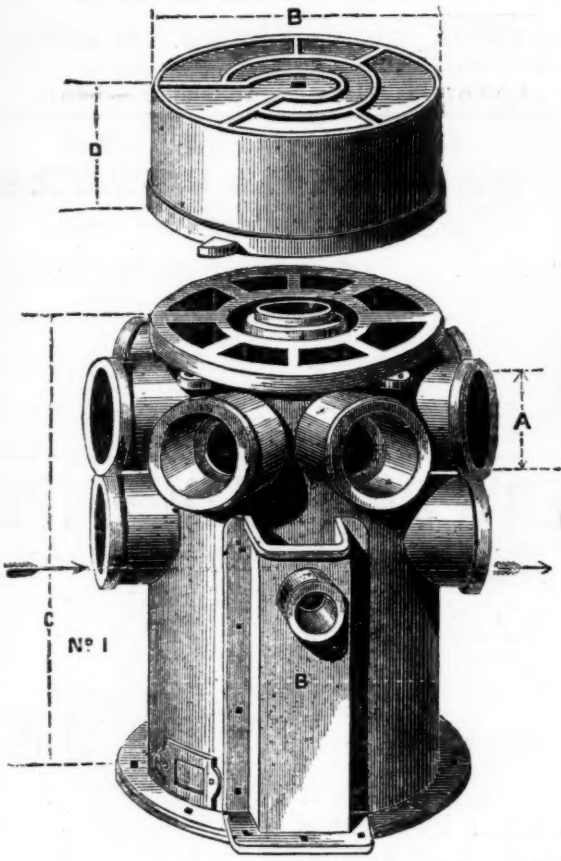
Has all the appearance of a Bright Fire.

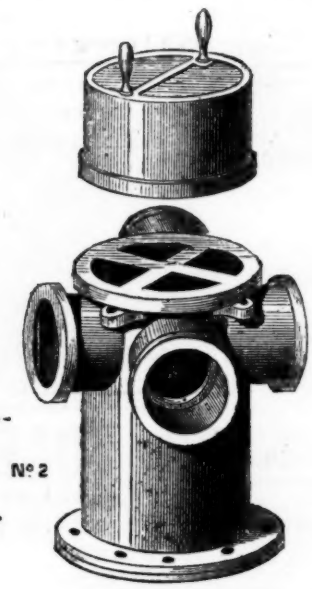
PRICE from 32s

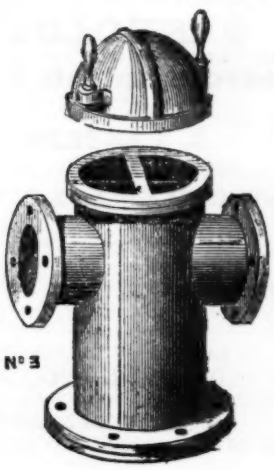
MESSRS. NEWTON, CHAMBERS, & CO.,

THORNCLIFFE IRON-WORKS, NEAR SHEFFIELD.

IMPROVED CENTRE-VALVES.







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IMPROVED BYE-PASS VALVE.
SIZES FROM 3 INS. UPWARDS.

THORNCLIFFE
IMPROVED STOP-VALVE
SIZES FROM 3 INS. UPWARDS.

Sizes of the THORNCLIFFE IMPROVED CENTRE-VALVE.

	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.
A. Bore of Pipe. . .	4 ..	5 ..	6 ..	7 ..	8 ..	9 ..	10 ..	12
B. Diameter of Body.	16 ..	20 ..	23 ..	26 ..	28 ..	31 ..	34 ..	40
C. Height of Tank .	33 ..	35 ..	38 ..	43 ..	46 ..	48 ..	51 ..	56
D. Depth of Cover .	8 ..	9 ..	10 ..	11 ..	12 ..	13 ..	14 ..	16
Total Height . .	44 ..	44 ..	48 ..	54 ..	58 ..	61 ..	65 ..	72

In all cases the Covers are cast heavy enough to resist any required pressure.

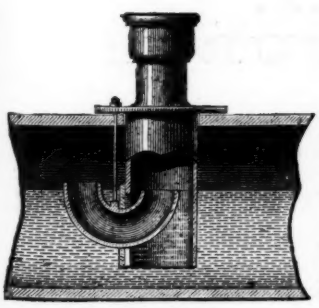
The advantages derived from the adoption of these Valves are so manifest and cardinal that in the immediate character of the change—the simplicity of the machine—the facility affording for cleaning out connexions between Valve and Purifier—the perfect collection and delivery by suitable overflow of the ammonia, at a greatly diminished depth from ground-line over the old form of Valve—the advantage of connecting on the same level, and at any angle, or opposite to each other, the inlet and outlet pipes without dip or rise—the clear acquisition of space in the purifying-house, by being able to place the boxes nearer together, the new Valve being entirely under the floor—and lastly, though of the greatest importance, the passage of crude and unpurified gas during the change is minimized to the merest fraction, thus preventing the fouling by impure gas the delicate machinery and easily affected exposed movements of the station-meter, thereby preventing the introduction of the enemy (unpurified gas) into the gasholder. Also a dead abutment is offered to all back pressure, imparting thereby to the gauges, governors, and hydraulic seals, a steadiness of action never realized with the once famous, but now fast becoming obsolete, Hydraulic Centre-Valve.

N., C., and Co. also Manufacture and Erect

PURIFIERS, CONDENSERS, SCRUBBERS, GASHOLDERS, ROOFS,

And every description of Gas Machinery.

TENDERS GIVEN FOR WORK FIXED COMPLETE IN ANY PART OF THE KINGDOM.



DIP-PIPE, No. 1.

Messrs. N., C., and Co. are also the Sole Agents for

HAWKINS' PATENT SELF-ACTING HYDRAULIC DIP-PIPES.

By their use the whole of the pressure caused by the Seal in the Hydraulic Main is entirely avoided, thus securing the many advantages long sought for.

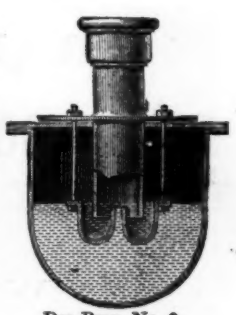
Over 50 Gas Companies have already been supplied with them, many of which have been using them throughout their entire works continuously for over two years.

They can be applied to existing Hydraulic Dips, and at a very small cost.

They seal themselves in the same manner as the ordinary dip-pipes, therefore they are not likely to get out of repair.

By the aid of the adjusting screws they can be made to work on the old principle at pleasure.

FOR PRICES, TESTIMONIALS, &c., APPLY TO



DIP-PIPE, No. 2.

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OR TO THE PATENTEE,

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RETORTS SET ON THE LATEST IMPROVED PLAN.
Retort-Setters sent to all parts of Europe and America.
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Estimates given and Contracts taken by the Manufacturer
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These Sieves are made with parallel or bevel bar, and guaranteed to be well seasoned yellow deal, and not common spruce so generally used.
N.B.—Specimens sent free on application.

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ARDWICK IRON-WORKS,
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IRON TANKS, GASHOLDERS,
GAS APPARATUS,
PIPES, VALVES, IRON ROOFS,
WROUGHT AND CAST IRON GIRDERS.
DESIGNS, SPECIFICATIONS, & ESTIMATES FURNISHED.

THE PATENT
CATOPTRIC LAMP
Is now in use in Moorgate Street, Cheapside, and Trafalgar Square, and has been in successful operation upon Waterloo Bridge since Oct. 7, 1871.
T. A. SKELTON, 37, Essex St., Strand, LONDON,
INVENTOR AND PATENTEE.

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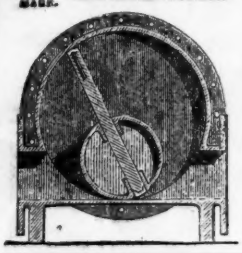
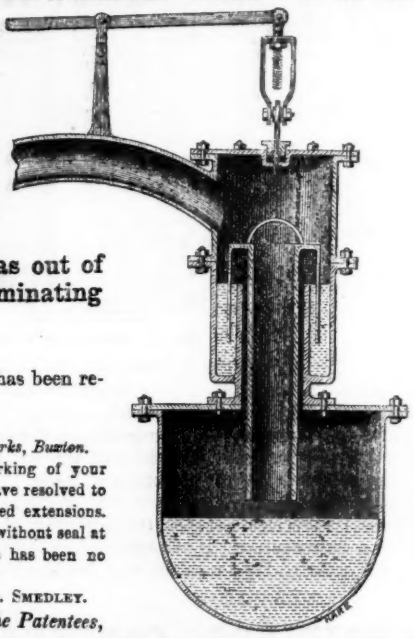
GAS ENGINEERS,
Gas-Meter, Gas Apparatus, and Gas-Fittings Manufacturers,
EDINBURGH, AND
2, KING EDWARD STREET,
NEWGATE STREET, LONDON.
Meter Works in London—2, CROSS STREET, WILDERNESS ROW, E.C.
STATION-METERS, GOVERNORS, CONSUMERS METERS, GAS LUSTRES, CHANDELIERS, BRACKETS, &c.,
And every description of Gas-Fittings and Gas Apparatus.

TRADE MARK.
J. BEALE'S PATENT GAS EXHAUSTER.



BEALE'S CONTINUOUSLY ACTING
GAS EXHAUSTERS
ARE NOW MANUFACTURED BY
B. DONKIN & CO.
MR. J. BEALE, of East Greenwich, having retired from business, has made an arrangement with B. DONKIN & CO. for the sole manufacture of his Patent Solid-Slide Gas Exhausters.
B. D. & Co. also make Steam-Engines to drive Gas Exhausters direct or otherwise, and Gas-Valves.
Estimates and Prices on application to
B. DONKIN & CO.,
ENGINEERS & IRONFOUNDERS,
BERMONDSEY, LONDON, S.E.

CHANDLER'S PATENT DIP-PIPE



The advantages are—
1st, There is no pressure on the Retorts.
2nd, No deposit of Carbon.
3rd, No scurfing required.
4th, Never a choked Ascension Pipe.
5th, Saves Fuel and Wear and Tear.
6th, Gets 10 per cent. more Gas out of the Coal, and a higher Illuminating Power.
7th, Is never out of order.

The following (among other letters) has been received:—
Messrs. Chandler and Sons.
Manager's Office, Gas-Works, Buxton.
Gentlemen,—I am so satisfied with the working of your Patent Dips during the last five months that I have resolved to recommend the adoption of them in our proposed extensions. I find it under perfect control to work with or without seal at pleasure, and that during the whole time there has been no deposit of carbon.—Yours, &c.,
Jan. 21, 1874. GEO. SMEDLEY.
For terms of use and cost, apply only to the Patentees,
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GRANGE WORKS, EDINBURGH,
MANUFACTURERS OF
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IMPROVED DRY GAS-METERS, in Cast Iron and Tin Cases,
OF THE HIGHEST EXCELLENCE,
Warranted to measure correctly, and not to vary.
STATION METERS AND GOVERNORS,
EXPERIMENTAL METERS, PHOTOMETERS, GASHOLDERS, &c.

TANGYE BROTHERS AND HOLMAN,

LAURENCE POUNTNEY LANE, LONDON, E.C.,

SOLE MAKERS OF

MORTON'S PATENT SELF-SEALING RETORT-LIDS,

WITH

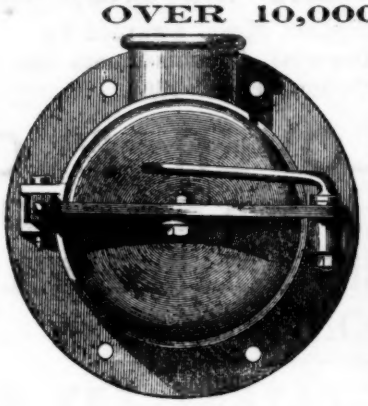
HOLMAN'S PATENT ECCENTRIC FASTENINGS & ANTI-FRICTION CATCHES.

OVER 10,000 IN USE.

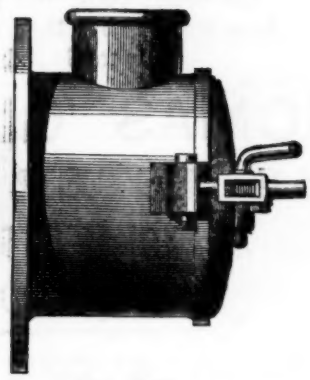
NO LUTING.

LIDS HINGED TO MOUTHPIECES; NO LIFTING ON OR OFF.

NO SCREWS FOR FASTENING.



FRONT VIEW.



SIDE VIEW.

SIMPLE.

ECONOMICAL.

DURABLE.

EFFECTIVE.

NO DUPLICATE LIDS REQUIRED.

These Lids are proved by many eminent Gas Engineers to be the most efficient, saving much time, labour, and expense; are opened and closed as quickly and with as little trouble as an ordinary furnace door, and by their use the Retorts are soundly sealed during the whole period of carbonization.

These Lids are Adopted by the following (among many other) Gas Companies:—

The Gaslight Company, Beckton (where over 2000 are in use).	The West Ham Gas Company.	The Salford Corporation Gas-Works.	The Carmarthen Gas-Works.
„ Gaslight Company, Bow Common.	„ Imperial Gaslight Company.	„ Rochdale Corporation Gas-Works.	„ Merthyr Tydfil Gas-Works.
„ London Gaslight Company.	„ Gas-Works, Arsenal, Woolwich.	„ Liverpool United Gas-Works.	„ Ystrad Gas-Works.
„ Independent Gaslight Company.	„ Commercial Gas Company.	„ Birkenhead Gas-Works.	„ St. Alban's Gas-Works.
„ Phœnix Gaslight Company.	„ Alliance and Dublin Gas-Works.	„ Birmingham Gas-Works.	„ Over Darwen Gas-Works.
„ South Metropolitan Gaslight Co.	„ Edinburgh Gas-Works.	„ Nottingham Gas-Works.	„ Aylesbury Gas-Works.
	„ Manchester Corporatn. Gas-Works.	„ Newcastle-on-Tyne Gas-Works.	„ Cardiff Gas-Works.

The Morton's Lid is made circular in form, that being the most convenient and suitable shape. It can be used for Retorts of any section, by adapting the Mouthpiece casting from the D, oval, or other shape, at the back, to circular in front.

The following important Testimonial has been given:—

THE GASLIGHT AND COKE COMPANY

(*Commonly called the Chartered Gas Company*),

MESSRS. TANGYE BROTHERS AND HOLMAN. *Beckton, North Woolwich, July* 2, 1874.

Gentlemen,—In answer to your inquiry respecting the Self-Sealing Lids, I beg to say that they continue to work well, and I have every reason to be satisfied with them.

I should be very sorry to return to the old system of Luting, and our stokers here freely acknowledge the benefit to them of the new system.

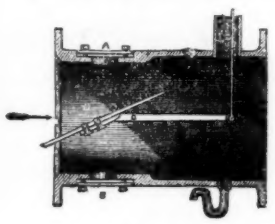
I am, yours truly,

(Signed) G. C. TREWBY.

P.S.—We shall have very shortly about 3000 of your Lids in use.

SOLE MAKERS OF

HUNT'S PATENT EQUILIBRIUM GAS GOVERNOR.



In this Governor a Throttle-Valve is substituted for the ordinary suspended Cone, all external communications being avoided by placing the Lever or Radius Arm (shown at C on the drawing) inside the Valve-Chamber upon the Disc. The Disc is carried upon steel centres, upon which it is accurately balanced and turns freely. The friction in working is thereby reduced to a minimum. This Governor is extremely sensitive to alterations of inlet or outlet pressure, and renders a large actuating holder unnecessary.

The principal advantages of this arrangement over the ordinary form of Governor are as follows:—

Its sensitive action prevents oscillation.

It is self-adjusting—i.e., it maintains a steady pressure under variations of inlet pressure or a fluctuating consumption.

The inlet to Gasholder being contracted to the smallest possible dimensions, all danger from leakage through insufficiency of seal, tilting, &c., is entirely avoided.

The valve portion being separate from the holder, it can be handled and fixed like an ordinary Slide Valve direct in the main; and the holder can be placed at any convenient distance immediately above it. The cost is thus materially reduced, and the inconvenience of heavy lifts done away with.

There are no working parts likely to get out of order.

These Governors have been adopted by several leading Gas Companies, among whom are the following:—

The Gaslight Company—a 24 in. at Whitechapel District Station.	The Gaslight Company—a 6 in. at the Gas-Works, Beckton.
„ „ a 36 in. at Goswell Road Station.	The London Gas Company—an 18 in. at the Gas-Works, Nine Elms.
„ „ a 24 in. at „ „	„ „ an 8 in. at „ „
„ „ a 24 in. at the Gas-Works, Beckton.	„ „ a 24 in. at „ „

Also at the Gas-Works, Rochdale, Monmouth, Devonport, Cannes, and Mentone (France), &c.

Vienna Exhibition, 1873.—The Grand "Medal of Progress"

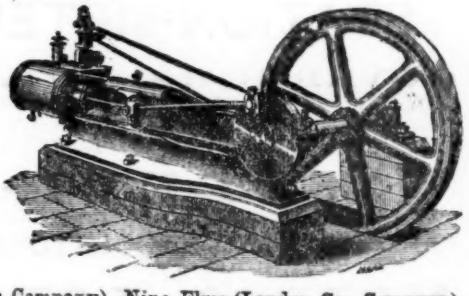
HAS BEEN AWARDED TO

Tangye's Horizontal High-Pressure Expansive

STEAM-ENGINES.

1200 sold since introduction in December, 1869.

Number	B	C	D	E	G	H	J	K
Nominal Horse Power	2	3	4	6	8	10	12	18
Price of Engine	£32	£38 15	£46	£70	£90	£115	£145	£185
Feed Pump, extra	£3	£3 15	£4	£5 10	£6	£7 10	£8	£10
Diam. of Steam Cylinder	4 in.	5 in.	6 in.	8 in.	9 in.	10 in.	12 in.	14 in.
Length of Stroke	8 „	10 „	12 „	16 „	18 „	20 „	24 „	28 „



These Engines are adopted in Gas-Works at Haggerston (Independent Gas Company), Nine Elms (London Gas Company), Falmouth, Harrow, Jersey, Plymouth, Richmond, Rochdale, Santiago (Chili), &c.

London 1851. New York, 1853. Paris, 1855. London, 1862.

Dublin, 1865.

The SIX MEDALS AWARDED to THOMAS GLOVER for

PATENT DRY GAS-METERS,

The latter being the Highest Medal awarded for Dry Gas-Meters by the Imperial Commissioners for the Universal Exhibition, Paris, 1867.

Paris, 1867.

THOMAS GLOVER & CO.,

DRY GAS-METER MANUFACTURERS,

214 TO 222, ST. JOHN STREET, CLERKENWELL GREEN,

LONDON, E.C.

THOMAS GLOVER & CO.'S PATENT DRY GAS-METERS,

1st, Are a remedy for all the defects of Wet Meters;
2nd, Are suitable for all climates, whether hot or cold;
3rd, Incur no loss of Gas by evaporation;
4th, Cannot become fixed by frost, however severe;
5th, Are the most accurate and unvarying measurers of Gas;
6th, Prevent jumping or unexpected extinction of the Lights;
7th, May be fixed either above or below the level of the Lights;
8th, Cannot be tampered with, without visibly damaging the outer case;
9th, Will last much longer than Wet Meters;
10th, Will not cost more than one-half for repair that Wet or Water Meters do;
Are upheld for five years without charge.

WILLIAM PARKINSON & CO.,

(SUCCESSORS TO SAMUEL CROSLEY,)

COTTAGE LANE, CITY ROAD, LONDON, E.C.

Established 1816.

MANUFACTURERS OF PATENT

WET & DRY GAS-METERS,

STATION-METERS WITH PLANED JOINTS,

GOVERNORS, PRESSURE REGISTERS, GAUGES,

AND EXPERIMENTAL APPARATUS,

STREET-LAMP METERS,

AND REGULATORS FOR AVERAGE METER INDICATION.

METERS FOR MEASURING WATER.

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THE JOURNAL OF GAS LIGHTING,
WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, DECEMBER 1, 1874.

Circular to Gas Companies.

The letter addressed to the Metropolitan Board of Works by the Imperial Gas Company, stating that while the company were not seeking to dispose of their undertaking, they were, nevertheless, quite prepared (if Parliament should hold that the transfer is desirable) to entertain any proposal for the purchase based on fair and equitable terms, did not evoke a song of triumph from the members of the Board. The communication went, we presume, to the Works and General Purposes Committee, whose works are apparent enough, but whose purposes are not always so evident. It is clear to us, however, that they do not purpose to buy the gas companies—if they can avoid it. The letter of the Imperial Company meets the Board at the first step. The company say to the Board, "You are promoting a Bill to effect "the purchase of the gas companies. Well, we accept it, and "agree to sell at a fair and equitable price. We have no fear "of competing works, and we are not afraid that Parliament will "consent to the ruin of our property." The decision of Parliament, we take it, will be clear and emphatic. They will say to the Board and Corporation, "You ask to purchase the gas-"works. Take them, and pay properly for them." Looked at from one point of view, the letter of the Imperial Company is well-timed and eminently judicious. It will be followed, we hope, by other communications of a similar character; and, since we do not believe that the Board and Corporation have any real desire to acquire the undertakings, the result, we anticipate, in Parliament, will be something very like what is called in chess a "fool's mate."

The belief that the purchase and sale will not be effected for some years to come, need not prevent us from making now a few remarks on the possible terms of purchase, particularly as some rather extraordinary notions on the subject are abroad. The terms hitherto sanctioned by Parliament for the purchase of statutory gas companies are clear, definite, and precise. They are either perpetual annuities equal to maximum profits, or the profits capitalized at 25 years purchase, with usually some premium. On such terms, we venture to say that the metropolitan gas companies may be bought, but on no other. They are based on sound commercial principles, and, as matters stand, they simply represent the market value of the commodity to be disposed of. But there appear to be those who think the above valuation extravagant; and we might imagine an agent for the sale of gas property addressing an audience of purchasers something in this style: "The investment I offer to your "notice to-day, gentlemen, is an extremely valuable one. Many "years ago my client laid out £100; for some years he got "nothing in return. Afterwards, he did obtain some little profit; "but now, for several years past, he has regularly received "10 per cent., and I may add that the business must be con-"tinuously and increasingly profitable. Being business men, you "can easily estimate the present value of the property. But I "am far-seeing. This island, now so happy and prosperous, is "slowly sinking into the bed of the ocean, and its downward pro-"gress may any day be suddenly accelerated. Moreover, we are "told that the end of the world is near at hand. Recognizing, "then, these elements of uncertainty, I shall be happy to take, "and recommend my client to accept, a bid from any one who "can hit upon a happy medium between market price and "nothing." That is really not a very exaggerated account of the views we see put forward; and it is well that it should be known at once that the proposal put forward is one which gas proprietors will never accept. They ask market value for their property, and no more, and they will not accept less.

Turning to the companies, we can only once more urge upon them that policy of amalgamation which has been recommended by the Board of Trade, and which can only, in any contingency, result in strengthening their position. Some natural jealousies will, doubtless, have to be overcome; possibly some sacrifices (they must be small) will have to be made. But the common good must first be considered, and it is quite clear that there is nothing the enemies of the gas companies now dread so much as complete amalgamation. Their present object is to sow dissension. We can only hope they will fail in their efforts.

We are fain to confess that the movement to establish a municipality for London, on which the future of the gas companies so much depends, makes but little progress. The general public at present stand aloof, doubtless because they do not realize the importance of the issue. Nothing as to the intentions of the Government can be gleaned from the utterances of Mr. Secretary Cross, who is nothing if not enigmatical, and who is at present devoting himself to the study of model lodging-houses and gunpowder-works. The question is, therefore, still an open one, and as long as it remains so, the fate of the gas companies is sure, if they only take care of themselves.

Ramsgate and Margate having had a very prosperous season, and the niggers and German bands having taken their departure, are now in a state of excitement over gas affairs. The inhabitants think (who does not?) that they pay too much for gas, and they want it cheaper. Ramsgate seems to think that the price would be lower if the Local Board obtained possession of the undertaking, and the inhabitants have been tantalized by a statement showing how cheaply gas may be made and distributed—upon paper. The inhabitants of Margate, however, are urged to start a competing company, with a view to the ultimate absorption of both new and old undertakings by the town authority. It is only fair to Margate to say that the householders did not seem at all disposed to take the ill-disguised bait held out to them. The Isle of Thanet Gas Company now supply the town with gas at 5s., and the promoters of the Consumers Company wished to persuade the inhabitants to engage to take gas from them at 4s. 6d. Possibly, some of the more shrewd saw in the distance the purchase by the town of two companies instead of one, or the more probable eventuality of a union between the two companies, which would leave the town at the mercy of the combination.

We are sorry for the people of Ramsgate, who had to listen to a tissue of as gross falsehoods as ever passed human lips, but we have some sort of sympathy on account of the rational conclusion they came to—first of all, to remonstrate with the gas company, with a view to obtain a reduction of price; and next, to procure the transfer of the gas undertaking to the Local Board. The Bill it is proposed to promote, to start a competing company in Margate, is likely to give rise to some curious complications. It is to be regretted that the Isle of Thanet Company have neglected to obtain statutory powers. There have been good reasons, in past times, for abstaining from an application to Parliament; but in these days no company of any importance

should remain without incorporation, with powers which Parliament alone can confer.

Dr. Redwood, we read, has a suspicion that there is "some "occult arrangement for getting rid of ammoniacal liquor" at the works of the Exeter Gas Company. Any arrangement of the kind suspected can only result in waste. It has been shown over and over again in our columns that ammoniacal liquor may be made, with profit, and without the smallest nuisance, into sulphate of ammonia, in much smaller works than those of the Exeter Company. We hope that in the interest of the shareholders, no less than those who live in the neighbourhood of the works, that the "occult arrangements" will be discontinued, and that the manufacture of sulphate of ammonia will be commenced, to the profit of the one and the comfort of the other.

Metropolitan gas affairs have lately occupied so much of our space, that we have been compelled to defer until now a notice of the Manchester gas accounts. In former years we have pointed out that the statement, though very elaborate, is deficient in some particulars. We are not told, for instance, the quantity of coal received and carbonized. We have no doubt the gas-works are perfect, and admirably managed; still the citizens of Manchester might have been told how many tons of coal were used to produce the 1,778,457,000 feet of gas "transmitted from the "works" in the year. Then, again, we might as well be informed of the quantity of gas *sold*, and thus we might be able to estimate the leakage from the 505 miles of mains the Corporation have now laid down. We would, in fact, recommend the Gas Committee to give, in future years, manufacturing details, in accordance with the form prescribed by the Board of Trade. No one could be injured by their publication, for, as we have said, we are certain that the works are in excellent condition and well conducted. Without the above-mentioned details, it is impossible to make an accurate statement of the relative cost of gas to the consumers in Manchester and London; but, making some allowances and a few guesses, we have arrived at the following calculations, which will not, we believe, be found wide of the mark. As corporate undertakings are just now of especial interest to the public, we have added estimates for other towns in which the undertakings are in the hands of the authorities.

	Quality of Gas in Sperm Candles.	Average Price per 1000 Feet Sold, including Meter-Rents.	Net for Coal and Cannel per 1000 Feet Sold.	Working Expenses per 1000 Feet Sold.
Manchester. .	18½ ..	3s. 8·37d. ..	16·19d. ..	13·21d.
London . . .	16 ..	4s. 1·49d. ..	16·06d. ..	17·53d.
Halifax . . .	14½ ..	3s. 9·31d. ..	8·30d. ..	18·41d.
Burnley . . .	16 ..	3s. 7·44d. ..	14·69d. ..	13·07d.
Rochdale. . .	18½ ..	3s. 9·66d. ..	19·86d. ..	13·52d.
Todmorden. .	17 ..	4s. 5·65d. ..	27·81d. ..	16·17d.

The candid reader who remembers the many and varied conditions involved in the supply of gas to the metropolis, must acknowledge that, after all, the *average* London consumer has very little to complain of, and that the charges of extravagance and mismanagement so constantly brought against the companies cannot be sustained. The London consumer is evidently better off than the Corporation-supplied customer at Halifax. Our readers very well know that we have no objection to the possession of gas undertakings by local authorities, but we have very strong and pronounced opinions as to the way in which such undertakings should be *financially* managed. We thought that all our readers would well understand our meaning when we used that expression, but we find we are mistaken. We must, therefore, briefly explain that, when we speak of "financial ma-"nagement," we make no allusion to the internal economy of the works. When speaking, for example, of Burnley and Rochdale, we know very well that managers like Mr. Leather and Mr. Hunter may be perfectly relied upon to do the best possible in the way of manufacture and distribution. It is to the appropriation of profits, which does not concern the engineer, that we object. We are opposed to the disposal of surplus profits in aid of rates, as at Rochdale, and to their accumulation, as at Burnley. In both of these towns, and at Manchester also, gas should be cheaper than it is. We see a new principle of rating being introduced—rating according to gas consumption, and we say it is utterly vicious and bad. When we hear that great improvements have been made in Manchester, and that a grand town-hall has been erected at Rochdale, out of gas profits, we say that the gas consumers, *quoad* consumers, have been robbed. They thought they were simply buying gas, and it turns out that they were paying for lots of things besides. Our notion of the financial management of a corporate undertaking is, as we have often said, that it should be, according to the Scottish system, a purely self-supporting concern. Let rates be levied according to the acknowledged principle—the rateable value of property—and let gas be sold at its proper price. In this way consumption would be greatly extended, and every ratepayer might become a consumer.

The test-acid question has now been fully discussed in our columns, and we are glad to have had the opinions of so many correspondents. We must leave our readers to form their own conclusions, but we may state our own opinion, that the best and most convenient standard to employ is 1 lb. of mono-hydrated sulphuric acid, diluted by the addition of distilled water to the exact volume of one gallon. No notice need be taken of specific gravities other than that of the original acid, which *should* have the gravity 1848. Such acid, however, the mono-hydrated, is rarely to be obtained, the highest in the market seldom reaching more than 1846. The difference to the seller of ammoniacal liquor is unimportant. The experimental results of Mr. Hartley support conclusions already arrived at by chemists. The existence of, we believe, six hydrates of sulphuric acid has been proved, and the formation of each involves condensation. More are suspected to exist, but the six we mention are proved. The end in view, as stated by Mr. Livesey, is to ascertain the number of ounces of SO_3 required to saturate a gallon of liquor. Substituting the formula H_2SO_4 for SO_3, the expression is perfectly correct. The mode of testing requires a *definite weight* of this mono-hydrated acid in a given volume. We want, as Mr. Hartley has said, 16 ozs. of H_2SO_4 in a gallon. With regard to the communication of Mr. H. E. Jones, which we publish to-day, we can only repeat the opinion we have before expressed, that the *real* value of ammoniacal liquor can only be ascertained by distilling a given measure of the liquor almost to dryness with lime or a caustic alkali, diluting the product to the original bulk, and then making use of the test-acid. Proofs accumulate that it often happens, from circumstances not at present understood, that much—sometimes, indeed, most—of the ammonia is present in the liquor in fixed combinations, and therefore is lost to the gas maker. We hope soon to have important communications on this serious matter.

Water and Sanitary Notes.

Notice has been given of a Bill, the object of which is to transfer the metropolitan water undertakings to a Royal Commission, who are to pay the shareholders annuities by way of consideration for the transfer, such annuities being guaranteed by Her Majesty's Treasury out of the Consolidated Fund, or any other source. Borrowing powers are necessarily suggested, and the amendment of the Metropolis Water Acts, 1852 and 1871, is proposed. This Bill, though introduced by a different firm of parliamentary agents, bears a family likeness to the Gas Bill mentioned in our last, and no doubt owes its birth to the same parents. Practically speaking, the two Bills involve the purchase of the gas and water undertakings of the metropolis by the State, for if the State gave a guarantee against loss, it would appropriate the profits. We do not think the time is ripe for a transfer of this kind, but we may confess that we would rather see the water undertakings in the hands of a Royal Commission than in the possession of the Metropolitan Board of Works, whose conduct with respect to a constant supply is, to say the least, extraordinary. Notice has been given to the Board that the East London and Kent Water Companies will soon be in a position to extend the area of their constant supply, whereupon the Board resolve to take no action in the matter. They will squander any amount of money in fighting gas and water companies, but not a penny will they spend in hydrants to save the property of their constituents from destruction. Their excuses, we must admit, are plausible. They have an expensive fire brigade, whose services they must still retain if hydrants be fixed. And a fire brigade, be it remembered, involves patronage. Then, as regards a constant supply to houses, it has been discovered that householders do not care about it, especially when it involves any expense—a fact we always knew, and have repeatedly stated. But householders have sometimes to be treated like children, who require to have physic forced upon them. Typhoid fever, we believe, is always present in London, but we have our "explosion" to come. So sure as it does come, Mr. Simons' inspectors, if they cannot find the cause in the milk-cans, will discover it in the air which gets into the water-pipes when empty, in consequence of an intermittent supply. And then what will be said of the conduct of the Metropolitan Board?

The report of the medical inspector to the authorities at Lewes is a remarkable one. He looked into the milk-jugs, and, not discovering the cause of fever there, he went to the water-pipes and found it immediately. In consequence of a very bad arrangement at Lewes, it is quite possible that sewer air may get into the water-pipes. But still, a specific origin for fever is required. Nothing but fever or small-pox, &c., we are taught, can beget fever or small-pox, &c., and, accordingly, we are asked to believe that at some time, heaven only knows when, and somewhere, nobody knows where, and somehow, under conditions no one

knows what, a case, be it of fever, or small-pox, or other infectious disease, occurred, and from this one case all others have since been derived. We need not stop here to point out that a general belief of this kind is fatal to the constitution of anything like a sanitary science. A common-sense man might suppose that the conditions which produced the first outbreak of the disease might at any time obtain again, and produce a like result, and he would seek to ascertain what those conditions are. Understanding, then, that an original case or cases of fever must have occurred in Lewes, some are found to have occurred in April and May last. These, by the way, are not accounted for. It then becomes necessary to trace the connexion of them with an outbreak which occurred in August. At this time there was a great drought, and the Lewes Water Company had to supplement the supply from their springs by pumping from the Cockshute River. This is a tidal stream that joins the Ouse, which receives the sewage of Lewes. The water company have placed a valve on the Cockshute, to prevent the tide coming up to the water-works. But some very wicked little children, who are evidently predestined to come to a dismal end, amused themselves, some time in July, by placing chalk stones in the valve, which prevented it from closing; and thus it happened that the *dejecta* of fever patients, which passed into the Ouse in April or May, were washed backwards and forwards up and down the Cockshute, for a couple of months or more, without undergoing decomposition, and at last, in August, were pumped into the water supplied to Lewes. Hence another outbreak of typhoid. There are profane people who will believe that the connexion between Tenterden steeple and the formation of the Goodwin Sands, rests on as conclusive testimony as this outbreak of fever on the contamination of the water supply of Lewes.

A TREATISE ON THE SCIENCE AND PRACTICE OF THE MANUFACTURE AND DISTRIBUTION OF COAL GAS.

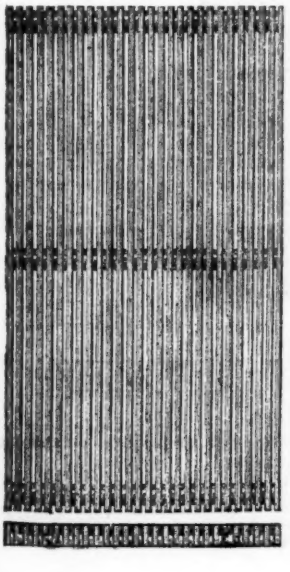
PURIFIERS.

XLI.

The largest dry lime purifiers which have come under our notice are 40 feet square; but, according to the most recently constructed gas-works, these are now limited in width to 20 feet. The object of this is obvious; for any unnecessary width of these vessels must cause the workmen, when removing the foul material, to be uselessly exposed to its pernicious influence; whilst, in consequence of the distance the foul material has to be carried, the expense of labour is also increased; therefore, if a purifier of the width stated be sufficient, any augmentation thereto must be prejudicial.

In the erection of the Beckton works, the dry lime purifiers were made circular; but this, in addition to their increased cost, as compared with square vessels, must of necessity be most inconvenient in charging and discharging, in consequence of the various irregular forms and sizes of the grids, and the difficulty experienced in sorting and placing them. These purifiers have since been replaced by others of 20 feet square. The purifiers at the new works of the Imperial Company at Bromley are 40 feet by 20 feet, and of these there are 24 in use, or in course of construction. Although circular purifiers are sometimes used, the plan is undoubtedly erroneous, for economy of labour, however slight, should always be sought; all the grids of any purifier, therefore, ought to be alike, so that any one of them, when taken at random, can be placed immediately, which cannot be accomplished with any other than the square or oblong purifier. The time and labour lost with irregular-formed grids, in selecting and fitting them in their places, should always be avoided.

The grids at one period most generally used were made of lengths of iron wire, of about one quarter or three-eighths of an inch thick, rivetted into a frame similar to a gridiron; hence their name. They are sometimes constructed of perforated sheet iron, or of cast iron; but those made of wrought iron are rapidly destroyed by the use of oxide, whilst those of cast iron, although presenting the advantage of considerable durability, are exceedingly cumbersome, and continually liable to breakage. Of late years an important improvement has been introduced into this part of gas apparatus by constructing grids of wood, which are admirably adapted for all the various purifying agents, whether lime, sulphate, oxide, or any other substance employed.



The accompanying engraving represents a wood grid as generally made, and consists of several battens of the length required, say, 3 feet, of about ½ inch thick and 2 inches wide. These are placed edgeways, parallel to each other, being separated by pieces of wood or washers, of about ⅜ inch thick, placed at three different points, as shown. At these points pass ½-inch bolts, their length being equal to the width of the grid, with their corresponding nuts, which secure the whole together, the two outer battens being made somewhat stouter and of harder wood than the others. These grids are usually 3 feet by 2 feet, a size and weight that a man can handle with facility. To all engineers troubled with the numerous annoyances attending the old iron grid, we strongly recommend those of wood, costing about 8d. per foot superficial, which are well suited for their purpose, and of great durability.

Among the various methods of lifting the covers of purifiers, in some small works a swing-crane, which commands two of the purifiers, is attached to the wall, and by means of a winch and chain the cover is raised, and the crane moved round therewith. In other works, a similar crane is placed in the centre of the purifiers, sometimes over and forming part of the central valve, and this in revolving controls the whole of the purifiers. A chain passing over a roller at the end of the jib is attached to the cover, which is raised by a winch, and, by turning the crane, it is removed.

The plan adopted by Mr. Cockey, for lifting the covers of purifiers, consists of a frame composed of standards, with a bridge or girder which extends the width of the purifiers. This frame is either attached to the purifier, in which case an apparatus is required for each, or it is made to run on rails, so that it can be conveyed to any point. At the centre of the bridge is a female screw, actuated by a bevel-wheel, which by suitable gearing is set in motion by a handle within reach of the workman standing on the floor. There is also a vertical screw, with suitable means of attachment to the cover, and this being operated upon by the female screw, the cover is raised or lowered.

A travelling frame, working on rails placed on the ground, has been adopted by Mr. Reid, of the Edinburgh Gas-Works; but, instead of a screw, he employs an hydraulic ram, which is placed in the centre of the girder; thus, by simply permitting the water to enter or flow from the ram, the cover is raised or lowered.

The hydraulic ram has been applied by Mr. Holman direct; it is placed right in the centre of the purifier, immediately under the cover. In like manner, by the admission of water into the cylinder the cover is raised, and by the contrary action it is lowered. This principle avoids the expense of rail and traveller; but, on the other hand, a separate apparatus is necessary for each purifier.

All these methods have so recently been noticed in the JOURNAL that further description is here unnecessary.

Hitherto we have spoken only of the apparatus ordinarily applied to the purification of gas, and suitable, with due care, to render it sufficiently pure for all practical purposes. But within the last few years considerable importance has been attached to the presence of the compounds of sulphur, which exist in gas after being purified in the usual manner, and the presence of which cannot be detected by the lead-paper test.

Undoubtedly the effects of these impurities have been much exaggerated, but it is now required that gas shall be purified in such a manner that these sulphur compounds are restricted within certain bounds, the limit generally being 20 grains per 100 cubic feet. In order to arrive at this state of perfection, other and entirely different methods of purification had to be adopted.

The central valve, with its combination of purifiers, as described, and as generally applied, permits of three of the purifiers being in action whilst the fourth remains inactive, the foul gas first entering that purifier containing what was considered to be nearly exhausted lime. Thence it passes into the second, where the lime is in a less exhausted state, the purification being finished in the third purifier. In this way the gas is freed from sulphuretted hydrogen; but though free from this compound, it may contain "sulphur" in other forms, which sometimes exists to the extent of 40 or 50 grains per 100 cubic feet of gas, and which cannot be removed by the old processes of purification; hence other means become indispensable.

But the hitherto supposed exhausted, useless lime, which has been shovelled out of the purifier, and wasted, is now ascertained to have only arrived at the stage when it begins to operate most powerfully (in the chemical form of the sulphide of calcium), for the purification of gas from the objectionable sulphur compounds; and it is well known that gas cannot be efficiently purified from "sulphur" without passing through at least one purifier containing the foul lime or the sulphide of calcium, and this after the first stages of the purification have been accomplished. Even when the oxide of iron is used, and when it is desirable to obtain only a reasonably perfect purification, this process is indispensable.

This more perfect means of purification demands an entire reversal of the operation, and for this object the foul gas is first admitted into a purifier containing fresh hydrate of lime (instead of, as in the old method, the exhausted or foul lime purifier), and this removing the carbonic acid, the compounds of sulphur pass forward.

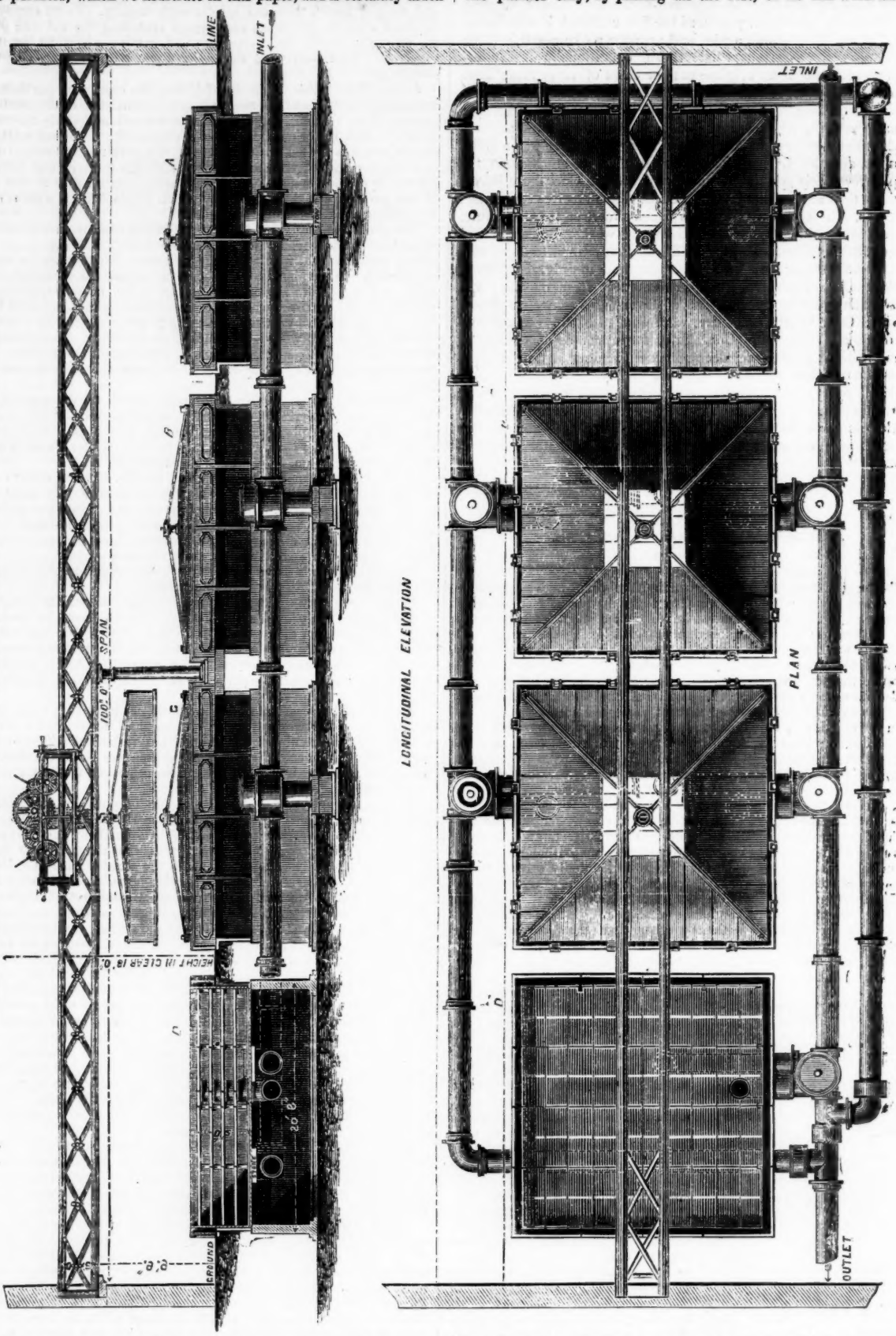
Other changes have taken place, and other requirements arisen, rendering it necessary that the manager of a gas-work should have his purifiers so arranged as to give him complete and perfect command over each and all of them separately, or all together; and he must also have the power of bringing his gas backwards as well as forwards, and reversing its flow during the process of purification. He must have the power always at hand of using fresh hydrate of lime in the first purifier. He must have one purifier at least always available for foul lime or the sulphide of calcium, and one purifier at least must be always available for finishing the purification.

Hence the former centre-valve, working three on and one off, becomes inapplicable, and were it attempted to use slide-valves in its place, the number that would be required—the complication of con-

nexions—would render it utterly unmanageable and unsafe to work; and they could not be practically applied.

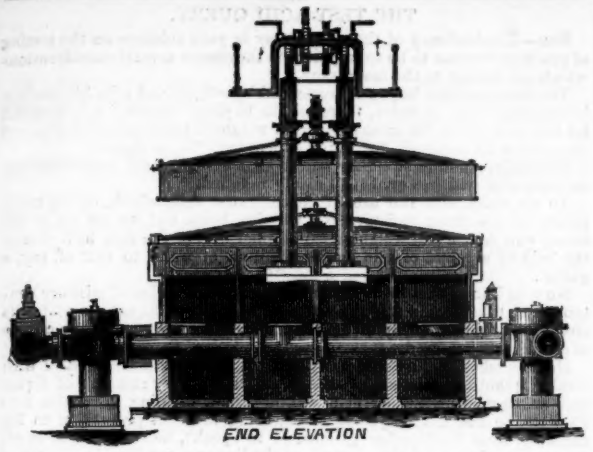
To meet these difficulties, Messrs. Walker have invented and patented a new system or, combination of valves, in connexion with the purifiers, which we illustrate in this paper, and is certainly much to be admired for the simplicity and perfection of the arrangements and the absence of all complication; for, according to this, a set of purifiers can be handled and worked with the greatest facility, a manager having the most perfect control over them. He can work one purifier only, by passing all the rest, or he can work all four

IMPROVEMENTS IN AND IN THE METHOD OF WORKING GAS PURIFIERS.—C. & W. WALKER'S PATENT.



purifiers in regular rotation, or any lesser number; or he can pass the gas first into No. 4, and come back to Nos. 3, 2, or 1; indeed, there is no requirement or mode of purification that cannot at once be met with perfect ease and simplicity; and any additional number of purifiers can be added and similarly conveniently manipulated. It will enable the system to be more clearly understood by comparing it with the centre-valve working three purifiers on and one off, which would be as follows:—

A	B	C
B	C	D
C	D	A
D	A	B



END ELEVATION

Hence no purifier can, by the ordinary centre-valve, be "bye-passed" out of the order described, and the purifiers can only be worked in the manner stated, the gas always travelling in one direction. By the improved system, illustrated in the drawing, the whole four purifiers can be easily and simply worked as follows, in regular rotation:—

A	B	C	D
B	C	D	A
C	D	A	B
D	A	B	C

Thus giving 25 per cent. additional purifying power at the disposal of the manager, which becomes of great importance, especially where large purifiers are used.

Not only is this large addition of purifying power rendered available, but any or either of the purifiers can be separately thrown in or out of action, emptied, replenished, charged with different purifying materials, or any change effected at once.

Thus A could be worked alone or D worked alone, or D could be made the first purifier, and the flow of gas reversed again back to A, the necessity for which, indeed, in the vicinity of towns, is imperatively necessary, for the odours given off by the foul lime, after being three or four weeks in a purifier, are such that a manager could not remove the purifier cover without causing offence in the neighbourhood. By this improvement a manager can render the foul purifier free from smell. The power of reversing the flow enables him to bring gas containing carbonic acid again into the foul purifier, displacing the sulphur and sending it forward. The new system of purification, commenced at Beckton—by which gas is day by day sent into London purified to the hitherto unknown extent of containing only 8 grains of sulphur in 100 feet—constituted a reversal, to a considerable extent, of the mode of purification hitherto almost universally in use. Purifiers are now made so much larger than formerly, in order to give more time for the gas to remain in them for the chemical combinations of the purification to be more slowly and perfectly effected. They now remain in action for *weeks*, instead of *days* as formerly. Hence, in the first place, it does not pay to have one large purifier standing idle for two or three weeks, and it is also very inconvenient; but a much stronger reason arises from the fact that a manager of a gas-work requires a much greater command over his purifiers than formerly to efficiently purify his gas, the standard of purification having, since the establishment of the new Beckton Works, been so largely increased; which standard will probably, eventually, spread all over Europe.

It is found in practice that during the long period of time a purifier remains in work, a condensed liquor is formed from the foul lime, of an exceedingly penetrating character, very destructive to cement joints of any kind. Messrs. Walker have, by some patented improvements, succeeded practically in planing and surfacing the flanges of these purifiers, joining them perfectly square and true, iron to iron, absolutely gas-tight, without any straining in the erection, getting rid of the liability of cracked plates, arising from being strained by bolts and nuts, and then exposed to contraction and expansion.

In concluding our observations on purifying apparatus, we recommend that they should always be constructed of ample capacity. More particularly we would urge this in the case of scrubbers, so that by the action of this part of the apparatus, the whole of the ammonia, so far as practicable, shall be removed from the gas. We further repeat the suggestion, that this valuable compound should be manufactured into salts upon the premises of the gas company where it is produced, which, as recently shown by a correspondent in these columns, may be made a source of revenue, even with a production of only 6 million feet of gas per annum. Should there exist facilities for disposing of the ammoniacal liquor, then the trouble of manufacture may be avoided; but, as a natural consequence in such cases, a considerable portion of the returns available from this source will be lost, as there must inevitably be the expenses of transport, barrels, storeage, and the manufacturer's profits.

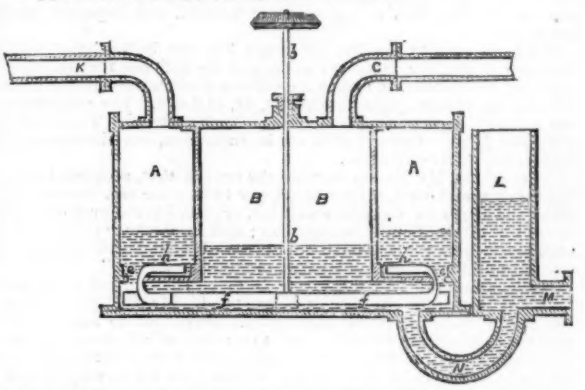
One of the modern methods of purification is to scrub the gas imperfectly, and afterwards to pass it through purifiers, charged with sawdust in combination with sulphuric acid, or, with the sulphate of iron. That these materials are very effective in eliminating the ammonia is beyond all question, but these systems of purification are highly prejudicial to the interests of the companies adopting them, unless, indeed, the foul material is manufactured by them, or a corresponding value equivalent to the ammonia it contains is realized therefrom.

The commercial oxide of iron, as sold for purifying gas, is composed of oxide largely intermixed with earthy matter. The only test of its value for the purpose in question is to ascertain by analysis the per centage of oxide contained therein. This, in some instances, we have known not to exceed 15 per cent. (the average being 30 or 35 per cent.) of the gross weight of the material. Hence the price of this commodity cannot be regarded as any criterion of value, without a precise knowledge of the quantity of oxide it contains.

Under most conditions, but particularly when transport is expensive, it is more advantageous to obtain the purest material regardless of the price. Peroxide of iron can be had at about £9 per ton, and, when intermixed with sawdust, as indicated, is probably the best manner of employing this purifying agent. Oxide of iron, under average circumstances, is much cheaper than lime for purifying; but, as the former only removes the sulphuretted hydrogen, one or more lime purifiers should be used in conjunction with the oxide, in order to eliminate the carbonic acid, and when desirable to remove the whole of the sulphur, a sulphide of calcium purifier must be employed.

It is generally accepted as rule that a bushel of quick lime, which, when slaked and rendered into hydrate, increases to about 2½ times its original volume, is sufficient to purify the gas derived from a ton of coal. This, however, must greatly depend on the quality of the lime and the manner it is employed, for there are some descriptions which contain a large per centage of argil; and although these are admirably adapted for the manufacture of hydraulic cement, they are ill suited for the purification of gas. But even with the best lime, if improperly applied, its purifying efficiency will be materially diminished; we therefore repeat that the lime, after being slaked, should be well moistened, and the purifier charged therewith directly it is prepared. Another consideration is, that some coals contain considerably more sulphur compounds than others, therefore no general rule can be defined; but, when properly treated, and the lime of average quality, the quantity stated may be accepted as a good approximation of that required for the purification of gas.

When lime is used as a purifying agent, in the condition of "wet lime" or "cream of lime," it is employed to the best advantage, and this is decidedly the most perfect of the old methods of purifying coal gas. The annoyances, however, experienced from the odour arising from the foul material, are such as to prevent this means of purification being applied at any works situated in the neighbourhood of human habitations; but as there may be some of our readers whose works in this respect are exceptional, and where lime may be procured at a very reasonable rate, and they can dispose of the foul material without difficulty, we present the annexed engraving as the apparatus used in purifying by wet lime.



As seen, the vessel is very similar to Malam's, already described and consists of the outer case, A A, with the internal cylinder, B B The vertical shaft, *b*, which works through a stuffing-box, is surrounded by a bevel-wheel, driven by suitable motive power, and attached to its lower part is the agitator, *f f* and *h h*, for the purpose of keeping the lime in a state of suspension. The gas enters by the pipe C, and forcing its way in bubbles through the liquid, is deprived of its impurities, and then passes off by the pipe K. The cream of lime is prepared in a separate vessel, and is charged by means of the pipe L, while to M is attached a valve for discharging the contents of the purifier, and N is the hydraulic seal.

Sometimes these vessels are placed in sets of three in combination, at different elevations, so that the foul lime can be run periodically from the uppermost to the second purifier, and thence to the third. The foul gas enters the lowest vessel, and there meeting with the foulest material, deposits its greatest impurities; thence it passes to the second, and from there to the uppermost vessel, where care is taken that the lime is always in a clean condition. This system of purification can be recommended in localities which permit of its application; but motive power of some kind is indispensable, in order continually to agitate the lime and keep it in suspension.

(To be continued.)

GAS AGITATION AT RAMSGATE.—A meeting of gas consumers and others was held in the town-hall, Ramsgate, on Tuesday, Nov. 17, "for the purpose of considering the best means for supplying the town and neighbourhood with good and cheap gas," and a resolution was adopted to address a letter to the directors of the Isle of Thanet Gas Company, asking whether they would be willing to sell the works to the local authorities, and upon what terms. The meeting was then adjourned until the 2nd inst.

Correspondence.

GAS PURIFICATION.

Sir,—The explanation given by Mr. Hislop* of his reasons for recommending the adoption of 6 square feet of area in his set of three purifiers per 1000 feet of gas made per day, does not, in my opinion, improve his position. Certainly his arguments will not satisfy gas managers of the necessity of providing such an enormous extent of surface.

But, indeed, it is evident that Mr. Hislop himself would not adopt the maximum which he recommends, for he says that if moderately dry coal is used, 4 square feet only is necessary; thus at once curtailing his previous estimate by 33⅓ per cent. If moderately dry coal be not *always* used, the remedy should be applied elsewhere than in the purifiers. It would be a proof of very bad management, surely, if the use of moderately dry coal were not everywhere the rule.

By leaving the carbonic acid to pass into the holders, Mr. Hislop gets rid of 50 per cent. of the remaining area, bringing it down to 2 square feet aggregate area of the three purifiers per 1000 feet per day. But why, according to your own showing, Mr. Hislop, deduct only 2 feet for the CO_2? Had you not better look to your combining proportions? This is coming "the old soldier" rather too strongly. The hop, skip, and jump style of argument will not do when one is professing to deal with the exact proportions of the several impurities. Looking at this offhand mode of filliping away first one-third and then another, one is involuntarily reminded of the old nursery rhyme:

"Three birds sat on a stone,
One flew away, and," &c., &c.

Or of the trick of the three cups and three balls we used to see performed in "our village" by the peripatetic showman; or (putting away childish things) of Captain Bobadil's method of vanquishing an army.

Mr. Hislop further states that his "special aim is to point out the importance of determining the power of the purifiers by the amount of work to be peformed, and not as has hitherto been the practice, and as existing rules alone recognize, by the volume of gas to be passed through them."

Now it is quite absurd for Mr. Hislop to assume that hitherto the amount of impurity has been ignored in determining the purifier area. If there were no impurities to be dealt with, it would be unnecessary to consider the question either of volume or of purifiers at all. The maximum amount of the impurities, in a given bulk of gas, requiring to be removed, is sufficiently well established, and is always understood when reference is made to the volume. With all deference to Mr. Hislop, it is of the *first* importance to take into account the volume of gas passing. It is this volume which must determine the area, with a view to regulating the velocity of the gas through the purifying medium. Were it a mere chemical question of so many equivalents of the various impurities requiring for their saturation so many equivalents of purifying material, then vessels of small size, charged a little more frequently, would fully answer the purpose. We know, however, that such is not the case, and that it is, to a great extent, the mechanical action of the volume of gas, in hurrying the impurities through purifiers of limited area too rapidly, that causes waste of material and imperfect purification.

With reference to the last paragraph but one in his letter, let Mr. Hislop just consider the point again, and he will see that as regards reducing the velocity, it makes no difference whatever whether he distributes the 24,000 square feet over 20, 10, or 6 sets. The proportion of the area to the gas passing is the same in each instance. The gas is not supposed to pass through each set in succession, but simultaneously, each receiving its own share.

To conclude, Mr. Hislop ventures the remark that, adopting his rule, the result would be a saving of ½d. per 1000 cubic feet between material and wages on the year's working, or £1375 per annum on a work of the size of the South Metropolitan; and he thinks "this would be sufficient to give a return upon the increased capital and land area required, with the addition of a bonus to the shareholders."

He does not show how this saving is to be effected, but let us grant, for the sake of argument, that it is as stated. Mr. Hislop is evidently inclined to be thankful for small mercies. He cannot be aware, surely, that the sum he names is only equal to a return of about four-tenths of a pound per cent. on the capital invested in such an undertaking. And would he be surprised to hear that it would involve an expenditure of at least *three times the sum* he names to pay the annual dividend on the capital that would need to be expended in order to provide the purifier area specified by his maximum rule?

The figures are before me as I write, but it is unnecessary to occupy your space by giving them in detail, as I am sure that Mr. Hislop, if he will only devote half an hour to the calculation, will be able to work them out for himself.

Gas-Works, Pernambuco, Oct. 20, 1874. Thos. Newbigging.

MANUFACTURE OF SULPHATE OF AMMONIA.

Sir,—In replying to "A Country Manager," whose questions are not applicable to my system of manufacture, in the first place I use a leaden tank surrounded by wood, in which is placed the acid and liquor, the mixing of which is a very simple affair, sufficient acid being added to the liquor to neutralize it. This mixture is then transferred to another tank of the same description, the size thereof being 60 in. long, 30 in. wide, 12 in. deep, which is filled to within 1½ in. of the top. The steam is then turned on from a steam boiler, and passes through a lead worm laid in the bottom of this evaporator. A wooden lid is placed on the top, and the edges hermetically sealed by a luting of clay which is placed around them. On the top of this lid there is attached a 5-in. pipe, which conveys all noxious vapours into the main flue at the back of the retorts, whereby they are consumed before reaching the top of the chimney. The time required for precipitating from 60 to 65 lbs. of sulphate is from seven to eight hours, dependent on the pressure of steam in the boiler, and provided the liquor is to its required density—*i.e.*, 7° Twaddel.

I use no lime or water; such ingredients would be fatal to the system.

Gas-Works, Bodmin, Nov. 28, 1874. James Thomas.

* See *ante*, page 366.

THE TEST-ACID QUERY.

Sir,—The tendency of the controversy in your columns on the testing of gas liquor seems to be to import into the matter several considerations which are foreign to the main issue.

The manufacturer buys sulphuric acid by weight, and sells his product in the same way. Clearly, therefore, in buying "liquor," it is simplest for him to ascertain its value in terms of weight of sulphuric acid required to combine its ammonia, hence the expression, "— oz. liquor."

Normally, a gallon of liquor would be measured and neutralized by concentrated acid (sp. gr. 1845°) nicely weighed.

To do away with the use of concentrated acid, which, owing to its power of absorbing moisture, is a variable body, and to get rid of the nicety and delicacy of weighing small quantities of the acid, he increases the bulk of a pound of acid by the addition of water to that of, say, a gallon.

Now he knows that every sixteenth part of this gallon of mixture contains 1 oz. of acid, and treating as before a gallon of liquor, he states its strength by the quantity of acid mixture, and consequently the ounces of strong acid required.

He now takes another step, and finding it more convenient to deal with smaller quantities than gallons, he takes an arbitrary measure of liquor and an equal quantity of acid mixture, and, dividing the latter into 16 parts, he has got a system which, being in strict proportion to his gallon process (Lilliputian gallons, so to speak), he is able with equal accuracy to determine the strength of the liquor per gallon in ounces of concentrated acid.

I must say, with Mr. Livesey, that I see no room for objections as to specific gravity of the mixture, nor do I see any force or meaning in the expression, "10 per cent. acid," as applied to the mixture.

A more interesting part of this subject was opened in your columns some time back—viz., the proportion of combined ammonia which escapes the acid test. This has been known to exist, but that the proportion of it should vary, and to what extent, is new matter to me; and supposing much variation to exist, probably buyers of liquor may not be able to average it in tendering, and so sellers may sometimes be at a loss. Your readers, I am sure, would be glad to hear more on the subject.

I am very sorry to see a little personality displayed in the controversy, towards Mr. Livesey.

Those who know the carefulness and painstaking with which he devotes himself to his profession, and have seen the unreserved way in which he gives to the humblest the benefit of his experience, without any dogmatism, will regret that he should be pained by such reflections.

Ratcliff Gas-Works, Wapping, E., Nov. 26, 1874. Hy. E. Jones.

Sir,—Since writing you, another view of this subject has presented itself to my mind, which I would lay before your readers, as one of the several *possible* solutions of this question.

To make 10 per cent. sulphuric acid, mix 1 lb. weight of sulphuric acid, sp. gr. 1845°, with 9 lbs. weight of water. The mixture will have a specific gravity equal to 1047·99°, or, in round numbers, 1048°, and could be designated 10 per cent. sulphuric acid, as estimated by weight, for $\frac{1728}{62{\cdot}5} = 27{\cdot}648$ cubic inches to 1 lb. weight of water; and 1 lb. weight of sulphuric acid, sp. gr. 1845°, contains 14·985 cubic inches.

$$\begin{aligned} \text{And } 27{\cdot}648 \times 9 &= 248{\cdot}832 \text{ cubic inches.} \\ \text{And } 14{\cdot}985 \times 1 &= 14{\cdot}985 \quad \text{,,} \quad \text{,,} \\ & \overline{263{\cdot}817} \text{ cubic inches.} \\ \text{And } 248{\cdot}832 \times 1000 &= 248{,}832{\cdot} \quad \text{cubic inches.} \\ 14{\cdot}985 \times 1845 &= 27{,}647{\cdot}325 \quad \text{,,} \quad \text{,,} \\ & \overline{276{,}479{\cdot}325} \text{ cubic inches.} \end{aligned}$$

$$\text{And } \frac{276{,}479{\cdot}325}{263{\cdot}817} = \text{sp. gr. } 1047{\cdot}99.$$

Nov. 23, 1874. Alpha and Omega.

Pollution of Rivers.—The Council of the Society of Arts have determined to hold a conference on Thursday, the 10th inst., "On the Steps to be taken to ensure prompt and efficient Measures for Preventing the Pollution of Rivers." The Right Hon. Lyon Playfair, C.B., M.P., F.R.S., LL.D., has consented to preside.

Explosion of Gas at Bath.—On the 19th ult. there was a serious explosion of gas in the shop of Mr. L. Howse, pawnbroker, Upper Borough Walls. An assistant, talking with some gentleman in the shop, detected the escape of gas, and search was made with a light for the leakage. On the assistant going to the glass case enclosing the window there was a sudden explosion, by which the shop-front was blown into the street. Fortunately, as the explosion took the opposite direction from him, the assistant was not hurt, and the customers were also uninjured. The only persons burnt were some men who were passing at the time on the other side of the road, and who were dashed against the wall. Some windows opposite were broken.

Sanitary State of Large Towns.—A preliminary meeting, called by circular, was held in Birmingham last Tuesday, under the presidency of the mayor, Alderman Chamberlain, to arrange for a public conference respecting the sanitary state of Birmingham and other large towns. The conference will be held on the 14th of January, in the Exchange Rooms, and there will be two sittings, one in the morning, for the consideration of the sanitary state of large towns and of hospitals for infectious diseases; and one in the afternoon, for the consideration of the dwellings of workmen, and proposed schemes for remedying their defects. It is intended to invite the attendance of Sanitary Committees and the co-operation of medical officers and others especially interested, from Manchester, Liverpool, Leeds, Sheffield, Bristol, and other large towns.

Pontefract Water-Works.—The week before last, portions of two large arches at the north end of the new reservoir in course of construction for the storeage of water for supplying the town of Pontefract, fell entirely to the foundations, and will, consequently, cause considerably labour and expense in replacing the same. The natural foundations are admirably adapted for the purposes of a tank, being hewn out of the solid rock. Puddling with clay for about 28 inches in thickness, at the bottom of the tank (which is also laid with bricks, two in thickness), forms the basis of building operations, the walls and pillars of which spring from the reservoir in a series of arches. The pillars at the north end have, it appears, subsided considerably, the arches of which were completed, thus reducing the whole, evidently from the compression of the puddling bed, on which the whole stands.

Review.

SOME PAMPHLETS.

We find on our table a few books, small in size, but valuable as regards their contents, and consequently deserving commendation. In *The Safe Use of Steam, containing Rules for the Guidance of Unprofessional Steam Users, by An Engineer*—(Lockwood and Co.)—we have the most sensible little book ever written on the management of a steam boiler. If all the directions it contains were observed, boiler explosions would be very rare, instead of frequent accidents. The book should be in the hands of every one who has charge of a boiler. It is written in a plain and simple style, with no more technicalities than are absolutely necessary, and an ordinary working fireman will easily understand it.

The Best Mining Machinery is the title of an essay by Mr. Ralph Goldsworthy, contributed to the proceedings of the Royal Cornwall Polytechnic Society (Earle, Falmouth). This fact alone is a testimonial to the value of the work. Mining is not in our line, but we find in the book some useful information on lifting water, which will be of interest to engineers. The author advocates the use of the old single-acting Cornish pumping-engine, and gives a valuable table of the duty of engines of this class, very useful for reference. There is also a section on lighting mines by gas, which we are sorry to see has been discontinued in Cornwall, after experience had demonstrated its economy. The author discusses the various methods employed to force gas down a mine, and then observes that "a water column, having the necessary pressure, is found to answer all practical purposes, sending a small stream of water down a 4-inch pipe. The steam is conveyed from the head to about 12 feet in the 4-inch main through a $\frac{3}{4}$-inch pipe, terminating with a $\frac{3}{16}$-inch jet, which carries the gas down the pipe, maintaining a pressure at all the galleries and levels, the water running off through a syphon or trap below the lower series of jets." For some reasons not explained, the author considers the use of a gasholder at the bottom of a mine as "highly objectionable." We should have thought it absolutely necessary.

In mining work proper the author is, of course, quite at home, and in this book, and in a very little compass, he gives a large amount of sound practical information on machinery, which we commend to the notice of every one engaged in mining operations.

Public Health Administration is an essay contributed by Mr. E. Ellice Clark, C.E., to *Public Health*, and now issued in a separate form (Pullen, Ramsgate). Without endorsing everything put forward by the writer, we do not hesitate to say that he makes many valuable suggestions. In one place he falls in with the opinion more than once expressed in these columns, that our present limits of area must be altogether discarded when sanitary works are under consideration.

"Why," he asks, "because an Archbishop of Canterbury, in 636, thought proper to divide the land to suit the purposes of the day, should we, in the nineteenth century, draw the same hard and fast lines, contrary to all idea of economy and efficiency, being, indeed, diametrically opposed to both? However startling the proposition may appear, we contend that the proper boundaries for sanitary authorities are the watersheds, and that all existing boundaries should be swept away." . . . "For our part, we do not see what existing boundaries, whether parochial or parliamentary, have to do with the matter; for drainage and water supply, nature has clearly defined the area in the watershed. There are no better illustrations of this than the Thames and Lea Valleys. Under existing circumstances, all the towns and districts in the Lea Valley are opponents, in consequence of adhering to the old parish boundaries. Stratford and Bow receive the sewage of all the towns above them, and naturally feel agrieved that they should suffer from mere situation. Tottenham, itself, offending against Stratford, grumbles, and obtains injunctions against Friern Barnet and Hornsey for polluting the Moselle stream, flowing into the Lea; Edmonton, Enfield, Ware, Hertford, and a score of other towns, offending in a similar degree, all opposed to each other, and the Lea Conservancy opposed to all. Could anything be more absurd than this? The sums of money paid by the parishes in litigation alone would have gone a long way to provide a proper system of drainage for the whole of the watershed, while the vast amounts paid by the separate authorities for the purpose of utilizing their own sewage, would have more than covered the whole expense necessary for a general scheme of drainage by combined action. What is the result of this parcelling out the sanitary work into the divisions left by the Saxons? There would be no greater inconsistency in retaining their system of disposing of excreta. The result is that, after a quarter of a century's labour, Tottenham is once more constructing expensive works; that Edmonton has a system of drainage already carried out, except that *houses cannot be connected with it* (!), while the Lea Conservators are dissatisfied with the whole of the parishes covering the watershed. As for the Thames Valley, things are so bad that they could not be worse, and we almost fear to publish the state of affairs. Sewage is poured wholesale into this grand river, the natural water supply of the metropolis, and innumerable pettifogging boards are striving their utmost to keep the river in a dirty condition. The whole of England is the same. The watersheds of the Trent and Mersey are identical [in condition] with the Thames and Lea."

There are many sound remarks, too, on the constitution of local boards, on the election of officers, and the class of men now required to fill the offices efficiently. The author insists that sanitary legislation, to be really effective, must be compulsory and not permissive, and consequently would confer unlimited powers on the central authority, respecting which much might be said.

Legal Intelligence.

MANSION HOUSE POLICE COURT.—Thursday, Nov. 26.

(*Before the* Ex-Lord Mayor.)

EUPION GAS SHARES.

The hearing of the charge against the directors of the Eupion Gas and Fuel Company, of defrauding members of the Stock Exchange, was resumed this day. The sitting, however, was only employed in formally reading over and verifying the voluminous depositions which had been taken since the prosecution was first instituted. The reading and verification extended over the whole sitting, and on the rising of the court the case was again adjourned to a day in this week.

HAMMERSMITH POLICE COURT.—Tuesday, Nov. 24.

(*Before* Mr. Bridge.)

POLLUTED WATER AT ACTON.

Mr. Hemsley, clerk of the Acton Local Board, appeared in support of summonses taken out with respect to three public pumps in Acton, the water being, it was alleged, injurious to health. The proceedings were taken by the board, under the 50th section of the Sanitary Act, which gives power to a magistrate, in the case of water in a well being unfit to drink, to remedy the same. The words of the Act are, that "if it should be reported to any sanitary authority that within the district any water in a well is polluted and injurious to health, they may apply to a justice for an order to remedy the same."

Mr. Hemsley said that long before the Act was passed notice was given that the water in the pumps was unfit to drink, but the people took it, and nothing was done. The pumps were used by persons living in the neighbourhood, and he had summoned certain owners of property interested in them.

Mr. R. Pollard, the medical officer of the board, said he knew of no illness being caused by the water.

Mr. Bridge inquired whether anything had been done in the neighbourhood to cause the pollution.

Mr. Pollard said nothing more than a slight increase in the population.

Mr. Bridge thought that a pubic pump should not be closed until everything had been done to render the water fit to drink. He had the power to order a remedy, and he should like to have a suggestion made to enable him to render the water fit for use.

Ultimately the summonses were adjourned for a fortnight, and Mr. Bridge gave instructions for water from two of the wells to be analyzed by a gentleman he named.

Mr. Walter A. Brown, a solicitor, watched the case on behalf of the rector of Acton, Mr. Bridge holding that any one of the public could be heard.

GREENWICH POLICE COURT.—Thursday, Nov. 26.

(*Before Mr.* Balguy.)

METROPOLITAN BOARD OF WORKS *v.* THE CRYSTAL PALACE DISTRICT GAS COMPANY.

DISCHARGING GAS REFUSE INTO A SEWER.

Mr. Biron, who appeared on behalf of the Metropolitan Board of Works, said he appeared in support of three summonses which had been taken out by the board against the Crystal Palace District Gas Company, for discharging into one of the sewers vested in the Board of Works a noxious fluid, a refuse of a peculiarly filthy character, which gave off deleterious gases in the highest degree injurious to life, and of such a nature that it was almost impossible when those gases were in the sewers for the men whose duty it was to work in the sewers to go about their occupation. The sewers, which formerly were vested in the Commissioners of Sewers, were by the 135th section of the Metropolitan Local Management Act, 18 & 19 Vict., c. 121, vested in the Metropolitan Board of Works. By the 205th section it is enacted, "That no scavenger or other person shall empty any rubbish or filth into any sewer or drain, or into any drain communicating with a sewer, or into anything which may discharge itself into a drain or sewer, and any one doing so shall forfeit and pay any sum not exceeding £5." During the course of last year numerous complaints reached the board of most offensive smells which were observed all along the course of that sewer which is known as the Ravensbourne and Sydenham sewer, and close to which, at a place called Bell Green, the Crystal Palace District Gas Company have their gas-works. Suspicion was aroused then, and it was thought that the smells were in consequence of discharges into the sewer from the company's gas-works. Remonstrances were addressed to the company, and there was an abatement of the nuisance. But at the beginning of the present month the like nuisance that was complained of in 1873 was again abundantly manifested along the whole length of the sewer. Complaints were made to the Metropolitan Board of Works, and Sir Joseph Bazalgette sent men to examine the sewer. On the 5th, 7th, and 11th of the present month they were sent into the sewer, and samples were taken of a dark, abominable, and filthy fluid that was running from a drain communicating with the gas-works, and emptying itself into the sewer. This fluid was escaping at the rate of two gallons per minute. The men took samples of it in bottles, and these bottles were placed in the hands of Mr. Keates, the consulting chemist of the Metropolitan Board of Works. He would produce those bottles, and describe, by scientific language and ordinary description, the nature of the fluid, and it would be satisfactorily proven that it was a most filthy fluid, and was discharged into the sewer from the works of the Crystal Palace Gas Company. As the company had been warned before and remonstrated with, the learned counsel thought it was a case where the magistrate might deem it his duty to impose a substantial penalty upon them. He admitted that something had been done since Nov. 11 to alter the state of things complained of, and the nuisance had been materially lessened. That, however, did not affect the state of things which existed when the summonses were taken out, and which, no doubt, would have continued but for the prompt action taken by the Metropolitan Board of Works. He proposed to take first the summons which related to what was done on Nov. 11, because that could be proven in a shorter space of time than the others.

Robert Seagoe, examined by Mr. Biron, said he was a flusher in the employment of the board. He knew the sewer called the Ravensbourne and Sydenham sewer, and that it ran from the pumping-station at Greenwich out towards Lewisham, and close by a place called Bell Green. On the 11th of November, he and another man, named Henn, went to Bell Green and found there two drains running into the sewer, one from the upper part of the Crystal Palace Gas-Works, which are situated at Bell Green, and the other from the lower part. Both he and Henn went into the lower one. They observed some very thick liquid coming from that drain, and they filled a bottle with it. It was not green or black, but between the two. It smelt very bad. It was being discharged at such a rate that they might have filled a pail in less than two minutes. After filling a bottle with this fluid, they carefully sealed it up, and Henn took it in charge.

In cross-examination by Mr. M'Connell, the counsel for the gas company, *witness* said: The water in the main sewer was 9 inches to a foot deep that morning. This was because of surface water. When no surface water is running it is about 6 inches deep. He did not know of any repairs going on at that time, nor of anything to cause a blocking up of the fluid.

Mr. M'Connell: Is not the sewer rather flat at that part—not much fall?

Witness: I do not know that it is so flat as that, if there was any great run of water it would run you off your legs. However, he admitted that it might not be so steep there as at other parts. It was only at the lower drain that he took out any fluid. The water in the other drain was much more clear. It was nice dry weather, but cold.

Alfred Henn, examined by Mr. Biron, said he was a foreman of flushers in the employ of the Metropolitan Board of Works. Was with the last witness when he took a sample bottle of the fluid that was discharging itself from the lower drain into the sewer, and sealed up the bottle with the fluid in it. It was given to one of the head foremen, and he sent Seagoe with it to Mr. Lloyd, of High Street, Deptford.

In cross-examination by Mr. M'Connell, he said he did not know of any repairs going on in the sewer at the time, and did not believe there could be any without his knowledge.

Seagoe was recalled, and, in answer to questions by Mr. Biron, said he took the bottle which Henn sealed up to the foreman or inspector, and was sent with it by the inspector to Mr. Lloyd, High Street, Deptford.

Mr. *Lloyd*, examined by Mr. Biron: He was one of the clerks of works for the Metropolitan Board of Works, and acquainted with the sewers under the control of the board. He knew the Ravensbourne and Sydenham sewer, and the two bottles he received had in them fluid taken from that sewer. It was a sewer which ran close under where the Crystal Palace District Gas Company's premises were; it ran through their premises. The two bottles which he received he sent to the engineer, at Spring Gardens.

Cross-examined by Mr. M'CONNELL, he said that he knew of all that went on in the sewer from one end to the other, but did not know of any repairs being done at that time. There had been repairs done since the 16th inst., but previously to that date there had been no repairs whatever for about five months. He thought the gradient at the part where the test fluid was taken out was about 10 feet in a mile. There was none of the objectionable fluid flowing on the previous day (the 25th), when he was there; and although asked by the gas company to take a sample of the fluid, he did not think it worth while to do so, and did not smell anything offensive. There was no blocking up of the water—nothing at all to cause a stoppage.

Mr. M'CONNELL: Then what is it that you complain of?

Witness: The men complain of fearful smells, so bad that they can sometimes hardly work in it, as if they were going to be suffocated.

On re-examination by Mr. BIRON,

Witness said he saw both drains opened yesterday, and they both ran from the gas company's premises into the sewer.

Thomas William Keates, Esq., examined by Mr. BIRON, said that he was consulting chemist and superintending gas examiner to the Metropolitan Board of Works. He received four bottles containing fluid on Nov. 14, and two on the 18th. The bottles in court were those he had received. The fluid did not look so bad now as when it was first sent to him; a natural change in it had altered its colour a little. When brought to him it was a turbid brown-looking liquid, containing a very large quantity of gas refuse. It resembled closely ammoniacal liquor, but it was evolving a large quantity of sulphuretted hydrogen gas, totally unfit to be sent into a sewer. Sulphuretted hydrogen gas is one of the most pernicious gases that can be inhaled; a small quantity of it will destroy life. Two gallons a minute of such stuff entering a sewer would throw off such a quantity of deleterious gas as, if the sewer were a small one, would make it impossible for men to work in it.

Mr. BIRON: You have described this liquid scientifically, but how would you describe it colloquially?

Witness: I should say it was a noxious liquid, unfit to be sent into the sewer, because the emanations from it would destroy animal life, and it would be impossible for the men to carry on their work.

Mr. M'CONNELL: I suppose there is no sewer in which sewage is passing free from sulphuretted hydrogen?

Witness: Oh, yes; the quantity of sulphuretted hydrogen in an ordinary sewer is very small indeed. You can walk through an ordinary sewer without suffering the slightest inconvenience; I have done it myself.

Cross-examination continued: He was quite certain that this liquid came from the gas-works; there were indications which to a chemist would be absolute proof that it came from gas-works. He could not say what part of the factory it came from, but it contained a substance which he had never known to be in a sewer except as coming from a gas factory.

Mr. M'CONNELL: Would not the presence of ammonia be accounted for by a number of horses?

Witness: No; certainly not.

Mr. M'CONNELL: Is it not characteristic of a stable?

Witness: Well, it is of urine from any source, particularly horses, but that would not in the slightest degree account for this liquid. I have no hesitation in saying it is gas refuse, and nothing else.

Mr. M'CONNELL: But sulphuretted hydrogen, would not that be accounted for by a number of men and the closets; is it not always characteristic of that?

Witness: It is characteristic of the decomposition of organic matter of many kinds, but nothing of that kind would account for this liquid.

Mr. M'CONNELL: But is not this impregnated with that which to let escape is to lose money?

Witness: That I cannot say anything about. The liquid in question was a gas product containing sulphuretted hydrogen. The ammonia in it would be valuable if taken out. It might, indeed, be called ammoniacal liquor, and I believe that it escaped from the gas-works during the process of manufacture.

In answer to Mr. BIRON, *witness* said that it threw off enough sulphuretted hydrogen to poison the atmosphere to any extent.

Mr. M'CONNELL said he appeared for the defendant company in this case, and he had to say on their behalf that they had no wish in any way either to annoy the public or set the law at defiance, but that they wished the case clearly proved as against them, as they did not know it themselves. He should prove that the works had been conducted in the most perfect way, and were a model of what such works should be, and if any escape had arisen it had been without the knowledge of the company, and they themselves did not believe that the matter was traceable to them, they having striven so much to prevent any nuisance arising, and having done everything that could be suggested by any one to lessen any smell arising from their gas-works. They believed their works so perfect that this could not be traceable to them. They had further done everything before and since to prevent smells, and the only thing that appeared to them might have caused such a smell was that some steam from the engines was turned into the sewer, and they thought possibly the steam and hot water might do it. Since these summonses had been issued they had turned the steam up the chimney. They thought also that part of the sewer had been stopped up on a flat part of the sewer, and that sulphuretted hydrogen might have arisen through the air-holes near the defendants works. He would call the manager and engineer, and others, who would speak to the state of the works, and the efforts that had been made to prevent any annoyance to any one. The liquor they were making was a liquor they would wish to retain and not to waste in any way; and he would ask the court to say that the case had not been made out, or to visit them with a very light punishment, in consideration of their efforts to do what was right in the matter.

Magnus Ohren, Esq., examined by Mr. M'CONNELL, said he was the secretary of the Crystal Palace District Gas Company. He had sent a written notice to the Board of Works and to the Lewisham District Board (whose clerk, Mr. Samuel Edwards, was now present), saying that they had opened the sewers for them to examine. Mr. Lloyd, from the Metropolitan Board, attended, but a letter was received from the Lewisham Board, saying that they did not think it necessary to send a representative. Witness was himself present at the opening of both drains on Saturday in presence of Mr. Lloyd. A large opening was made in both the drains, so that the water could be seen flowing. He thought some one would be sent from the board to take samples, because the gas company knew that they had done nothing to cause a nuisance. The water was taken out and tested in his presence. There was no time to analyze it, but simply test it, and it contained no sulphuretted hydrogen whatever. As to the gas-works themselves, the company had always worked them in the most efficient manner possible, to which fact Dr. Letheby had borne testimony, having had to examine them on another matter some short time since.

Mr. M'CONNELL was about to read Dr. Letheby's report, when

Mr. BIRON interposed, and said that no doubt the gas company did all they could to conduct their affairs in a businesslike way, and he did not suppose that what was complained of was wilfully done.

Mr. M'CONNELL (to witness): Has everything which has been recommended to you to prevent unpleasantness to your neighbours been attended to?

Witness: Certainly.

Mr. M'CONNELL: And your works are in a model state?

Witness: They are.

Mr. M'CONNELL: You have tried to prevent any escape?

Witness: We did not know of any. I saw the drains myself, and I cannot account for the state of this water.

In answer to the MAGISTRATE, *witness* said that he saw the drains on the previous day. At the suggestion of Dr. Letheby and their own engineer, they were building a wall simply that people might not complain of their not doing everything they could to prevent any annoyance to any one; and when these very drains were laid down the gas company gave a special charge to the engineer that they should be properly laid.

In cross-examination by Mr. BIRON, *witness* explained that the steam was used in their manufacturing purposes, and was discharged from the engine and boiler, but the engineer knew more of that subject than he did.

Mr. *James Watson*, examined by Mr. M'CONNELL, said he was engineer and manager of the works, and knew them thoroughly. Had been engaged there two years and a half. He knew the drains well, and had taken every precaution to prevent smells or unpleasantness arising from them, having been directed by the directors to do so. All the surface water from the place and the sewage from the closets went into one or other of those drains. There were 200 men and 16 horses. Having heard that the sewage seemed hot, it occurred to him that the steam might have caused certain gases to escape from the sewage up the air-shafts, and so created the annoyance complained of; he therefore caused the steam to be turned from the sewer and carried up the chimney-shaft. That was on Saturday, the 21st inst. As to letting any of the ammoniacal liquor escape, it was too valuable for him to think of allowing such a thing. He took every care to preserve it, and kept it in tanks made for the purpose.

Mr. *Midwinter*, examined by Mr. M'CONNELL, said he was chief assistant to Dr. Letheby, and attended there instead of Dr. Letheby, who was ill in bed. Had had great experience in Dr. Letheby's laboratory in analyzing sewage. He had found that strong sewage did give off sulphuretted hydrogen.

On being asked by the MAGISTRATE what he called strong sewage, *witness* said sewage not very much diluted with water.

In answer to Mr. M'CONNELL, *witness* said he was present the day before at the opening of the drains, and he examined samples taken from them and from the main sewer, and the samples taken from the gas company's drains were far superior in quality to those taken from the main sewer. As to the hot steam acting on the sewage, the warming of sewage containing sulphuretted hydrogen would cause that gas to be disengaged, it being so much more soluble in cold water than in hot. If the sewer were at all blocked up, a large quantity of sulphuretted hydrogen would certainly be generated.

In answer to Mr. BIRON, *witness* said that in most cases sewage threw off large quantities of sulphuretted hydrogen unless extremely diluted with water.

Mr. BALGUY said it was evident there must be a conviction. Although he had no doubt, and it was admitted by the Metropolitan Board of Works, that the Crystal Palace District Gas Company did all in their power to abate any nuisance, yet there appeared to have been a nuisance by a discharge of the gas refuse into the sewer; the only question was a question of penalty. It was impossible to contend against the evidence of the two flushers, who on the 11th of November saw this matter, of which they took two bottles, and the chemist analyzed it, and came to the conclusion that it was deleterious to everybody who might go near it.

Mr. BIRON then asked for the costs of the summonses.

After some conversation, in which Mr. M'CONNELL suggested that earlier notice should have been given to the gas company, Mr. Biron withdrew the two remaining summonses.

Mr. BALGUY said the fine would be 40s., and 5 guineas costs.

Miscellaneous News.

IMPERIAL CONTINENTAL GAS ASSOCIATION.

The Half-Yearly Ordinary Meeting of the Proprietors of this Association was held at the City Terminus Hotel, Cannon Street, London, on Tuesday, Nov. 24.

Mr. NEWTON, one of the directors, commenced the proceedings by saying: We have been accustomed from half year to half year to see the chair at these meetings occupied by our worthy friend, Mr. Twells, M.P., who is the chairman of the board of directors and deputy-chairman of the company, in the absence of our venerable president, Sir Moses Montefiore. Mr. Twells is himself absent to-day through a necessary holiday, and therefore I beg to propose that Mr. Julian Goldsmid, M.P., do preside.

The motion was seconded by Mr. JOSEPH SEBAG and carried unanimously, and Mr. Goldsmid took the chair.

The CHAIRMAN: Gentlemen, before I call on the secretary to proceed with the usual business, I think it is only right that I should just refer to two circumstances which affect this company. In the first place, you will learn from the report about to be read, that during the past half year one of our directors has died, and I am very sorry to add that, since the report was written, another director, whose face has been well known for many years—Mr. Attwood—has been taken from us. He died, after a very short illness, last Sunday morning. I am sure that every shareholder present, whatever differences of opinion may have existed between him and Mr. Attwood, will be prepared to acknowledge the high integrity of his character, and to feel sincere regret at his sudden death. The other circumstance to which I wish to allude is this: Our esteemed president, Sir Moses Montefiore, was most anxious to have been present to-day, but is unable to gratify his wish. He has written a letter to Mr. Twells, in which he says that he has, unfortunately, a severe cold, which has for some weeks confined him to his chamber, or he would have been glad of the opportunity of congratulating the shareholders upon what he considers, under the peculiar circumstances, the highly satisfactory condition of the affairs of the association.

The SECRETARY (Mr. Albert F. Jackson) having read the notice convening the meeting, the corporate seal was affixed to the register of shareholders, and the following report presented:—

The present half-yearly ordinary meeting of the shareholders has been convened, agreeably to the company's Act of Parliament, for the purpose of receiving a report from the president and directors upon the affairs of the association, and for declaring a dividend for the half year ended the 30th day of June last.

Gas Made.—The total quantity of gas made at all the stations in the half year ended June 30, 1874, was about 2450 million cubic feet. The total quantity made in the corresponding half year of 1873 was about 2490 million cubic feet; being a decrease of about 40 million cubic feet, or at the rate of about 1·65 per cent.

Lights.—The total number of lights at all the stations on June 30, 1874, was about 1,044,243. The total number of lights on June 30, 1873, was about 972,301. These figures show an increase of 71,942, which is at the rate of 7·3 per cent.

Mains.—The total length of mains laid up to June 30, 1874, was about 1174 miles, being a decrease of nearly three miles on the corresponding half year of 1873, owing to the sale of our works at Cologne.

The works and apparatus at the several stations were, and continue to be, all in good working order.

The staff has remained under the able superintendence of Mr. G. W. Drory, but there have been some few changes in it, owing to the death of Mr. Skinner, long a valued servant of the association at Vienna, and to the general requirements of the service.

Coal.—The coal employed in the half year ending June 30, 1874, cost about £37,000 less than in the previous half year ending Dec. 31, 1873, owing to the facts that 18,000 tons less were used, and that there was a very slight decrease in price.

There is, however, an increase of nearly £20,000 in the expenditure on coal in the half year under consideration, as compared with the corresponding half year of 1873, although the quantity consumed was less by nearly 20,000 tons. This is owing to the increase of price between the two half years—namely, about 3s. 7½d. per ton.

The rental for the half year ended the 30th of June last (1874) was less by the sum of £1417 than for the half year ended June 30, 1873.

The profit also was less by the sum of £34,251 than for the corresponding half year of 1873.

This diminution of profit was the consequence of the enhanced price of the coal, iron, labour, and every other material employed, of the diminished value of the secondary products, and of the decrease in the consumption of gas from trade generally having been bad.

Secondary Products.—The value of the secondary products, coke, tar, and ammonia, was only 58·06 per cent. of the cost of coal, being a decrease of no less than 10 per cent. on the corresponing half of 1873. This diminution of value was greatly caused by the mildness of the weather, which rendered it impossible to sell coke at a price proportionate to the high cost of coal.

The difference between the price realized for coke in the half year ending June 30, 1874, and that realized in the previous corresponding half year was very serious.

Various additions to, and alterations of, apparatus have been made at the different stations of the association.

At Berlin additional retorts were erected on the main works. At Antwerp new stores and an iron roof were built on the old works, and new condensers at the new works. At Lille retort-beds, purifiers, a station-meter, and a new 80-feet gasholder were put up. At Brussels a retort-house, retort-beds, wash-vessels, scrubbers, and purifiers were put up, and excavations made for the new works at Kockelberg.

At Aix-la-Chapelle the new works at Haaren were prosecuted, including retort-house, scrubbers, purifiers, and a new 100-feet gasholder.

These works and other minor additions and alterations at the other stations entailed a very large expenditure. A further outlay was incurred in extensions and substitutions of mains.

In May last a contract was signed for lighting the small townships of Bickendorf and Ossendorf, contiguous to Ehreufeld, upon terms similar to those in the Ehrenfeld contract.

At Bordeaux the usual annual reduction of 1 centime per cubic mètre came into operation on the 1st day of this present year.

Negotiations continued with the authorities there resulted in the signature of an agreement between them and the association, that if the latter did not obtain the new contract, it should in the year 1875 give up all the works, mains, and plant for a sum to be fixed by a valuation to be made by experts mutually appointed by the town and company.

At Antwerp the negotiations alluded to in the last report resulted in a new contract being signed last May by the municipal authorities and the association.

At Haarlem, after protracted negotiations, the association in March last proposed a draft contract to the Town Council, who in April last rejected it. The town towards the end of last June submitted for acceptance by the company a draft of a contract. Its terms and conditions, however, were not only most onerous, but also likely to involve a considerable loss, so that it was totally impossible to accept them.

At Cologne the proceedings necessary for the adjustment of the outstanding accounts between the town and the association were continued. When the final settlement may be arrived at appears uncertain.

At Vienna the association in March last proposed to the authorities a draft contract for the renewal of the public lighting of that city. That draft was in the month of June last rejected by them, and they in the same month had a draft contract prepared which the association was with regret unable to accept. The whole question is still under consideration.

At Brussels no negotiations for a new contract having taken place since the abortive adjudication in October of last year (1873), and the authorities having declared their intention to take over the company's works at a valuation by mutually appointed experts, the initiatory steps for the *expertise* were taken.

The president and directors would now beg to draw the attention of the shareholders to the accounts for the half year ended the 30th of June last. From these accounts, which have been duly audited, the directors have, in accordance with the provisions of the Companies Clauses Consolidation Act, prepared a scheme, showing the profits of the association for the past half year, and the portion thereof applicable to the purposes of dividend, which the president and directors recommend now to be declared—namely, a dividend of £1 15s. per share, payable, free of income-tax, on and after the 15th of December next.

The directors must now call the special attention of the shareholders to the fact that, owing to the circumstances before mentioned, the profit of the half year now under consideration has been very materially reduced, so much so indeed, that if the prospect for the future were not somewhat improved, the directors would feel obliged to recommend a further reduction in the dividend; but, as the returns of the current half year are somewhat more encouraging, the directors have determined to recommend the declaration of the same dividend as was paid for the last half year.

In conclusion, the directors have to report with much regret the loss by death of their late esteemed colleague, Mr. John Carrington Palmer.

The CHAIRMAN: Gentlemen, in moving the adoption of the report just read, and in which we have endeavoured to state to you, as far as we could, the exact position of the affairs of the association, I shall have to offer to you certain explanations, which it has been usual for the chairman to give on these occasions. In the first place, the chairman has generally directed attention to the proceedings of the half year embraced in the report, and then, according to a very wholesome practice, as I think, he has brought before you any events which have occurred since that date, and which he considers may be of interest to the proprietors, and which could not be mentioned in the report, as that document applies only to the half year ending the 30th of June last. You will observe that practically there has not been much increase in our business at most of the stations during the first six months of 1874—that, in fact, the reaction in commerce which has extended all over England has also extended over most places on the Continent, and therefore the result of our work, as far as the amount of business done is concerned, has hardly varied at all from the corresponding half of the previous year. But that has not been the case with regard to the first element which we have to consider in carrying on our business, and that first element is the price of coal. Of course, notwithstanding anything that may be said by people out of doors—and the assertion has been very broadly made—the business and profit of a gas company depends, if not entirely, certainly in its greater proportion, upon the price of coal; and though during the past half year there was a very slight diminution in the price of coal, as compared with the half year immediately preceding, the increase in the outlay on that head upon the corresponding half of 1873 was no less than £20,000. The consequence was that, although we used 20,000 tons less, we practically have a much smaller surplus than we had at this time last year. I want you thoroughly to understand this question of coal. In a business like ours, in which we deal, not with hundreds of tons and not with thousands of tons, but with tens of thousands, we have to take care many months beforehand that our supplies shall be sufficient for the current business. If we did not do it, the result might be that a frost happening all at once, or some other accident arising, might cause us to be deficient in the primary supply, and thereby prevent us from fulfilling our contract to the full extent which is absolutely necessary in every town on the Continent. It is more necessary than in England, because many of our rights depend upon accurate attention to the terms of our concessions, which in many cases are limited in time. The result, therefore, is that for the coal which we used during the half year now under consideration we were naturally obliged to contract in the previous summer, and, as every one knows, at that time coal had hardly begun to descend from those extravagant prices which had prevailed for a considerable period. We have to make contracts for coal all over Europe, and it is of prime necessity that we should be always well supplied in advance. The consequence is that the half year under consideration is burdened with a very heavy charge for coal, although I may say this, that I believe no company obtained their coal, upon the whole, upon such reasonable terms as we did, or ran the owners so close as we did in making contracts. These remarks will explain to you in the most simple way the reasons why our profits are so largely reduced. But, as stated in the report, there is one thing that is very encouraging—viz., that coal has fallen considerably; and though in the current half year we may not reap the full benefit of the reduction, we are reaping some benefit, and shall hereafter receive more. I trust we may never see again a state of things so abnormal as has prevailed in this matter. Well, gentlemen, I think these circumstances will fully account to you for the position of our business at the present moment; and there is this much to be said also upon one other point more or less connected with the question of coal, and that is the price we can obtain for secondary products; for, as you know, if we can get a very high price for secondary products, it will, to a certain extent, though not absolutely, recoup the additional price we have to pay for coal. Unfortunately, this matter is governed to a great degree by the mildness or severity of the season. The past winter happened to be one of the mildest on record, and coke consequently fell very considerably in value, which acted in a most unfavourable way upon the result of the revenue for the half year under review. So much for that question. And now, I think, it is right that I should state to you some few circumstances connected with the business of the various stations. In the first place I would just refer for a moment, and only for a moment, to the fact mentioned in the report, that at Vienna the proposals made by us for the public lighting were not accepted by the Town Council. You are aware, probably, that we maintain—and, as we believe, on the best legal grounds—that we have a right to the private lighting, independently of our contract for the public lighting. But, as I said, the proposal for the public lighting was not accepted, and since then a proposal made by the Town Council to us we have been unable to accept, because it appeared to us that the conditions were too onerous. This matter has required constant attention by, and has been the source of great anxiety to, the board. The work involved has been exceedingly great; we have been obliged to hold constant meetings on the subject, and some of the directors have been at the office from day to day attending to the correspondence. As the whole question is still *in nubibus*, it is necessary that I should appeal to your forbearance not to ask any questions on the subject, and I am confident in the answer to that appeal. The only thing I would say upon it is, that hitherto the attention it has required has been incessant, and, so far as the directors are concerned, they are perfectly ready to continue their efforts, as they have devoted them, to the satisfactory settlement of the question. With regard to Antwerp, I need only confirm the fact stated in the report, that we have signed a new contract, and we may say that affairs there are settled. With respect to Brussels, notice has been given by the authorities to purchase the property of the association, and we shall have a valuation made of it. Whether the municipality will carry out their expressed intention to acquire the undertaking, or will come to some other arrangement, I do not know, but, no doubt, we shall not lose anything there—we shall either get the value of our property or a continuance of the concession. With regard to Haarlem, which is not so large a station, matters are *in statu quo*; we have not yet been able to arrive at an agreement, and I do not know when we shall. And now I should like to tell you a little more on the subject of Bordeaux. You remember that the chairman on the last occasion, and on more than one occasion previously, stated to you the peculiar position of affairs at Bordeaux. You will all remember the long negotiations carried on with us for the renewal of the contract. You will all remember how those negotiations proved abortive, and you will bear in mind also that the town authorities resolved to put up the public lighting to public adjudication. The result of that adjudication was that the contract was obtained by a man named Gautier, on behalf of a company called *La Société des Usines à Gaz Réunies*, in Paris. From information of a most accurate character received by us, we knew that that person was not a man of substance; we knew also, what was more important, that the company he represented was not a company of substance, and that, instead of making a profit by the working of the stations they then had, they were making a very large and heavy annual loss. We knew, therefore, that if it came to the question of their offering to buy our works, we could not be certain that we should obtain the money even if we contracted to sell them. And we knew also this, that if we did not contract to sell them, our property would not be of the value at which it stood in our books. This was a most serious condition of things, and, as you are already aware, I, at the request of the directors, as Mr. Drory's health did not permit him to act, went to Bordeaux, saw the then mayor, and obtained all necessary information with regard to the position of affairs. He received me in the most courteous manner, but he told me that if we meant war, all he asked was that we should make it at once. In pursuance of that suggestion of his, which I thought reasonable, and finding that an appeal to the *Conseil d'Etat* might be successful, I left Bordeaux the same evening, and arrived in Paris the following morning, saw the ministers, and in a short time got a reversal of the contract by the *Conseil d'Etat*, so that M. Gautier's competition was put an end to. Since then the fact that our information was correct is proved by circumstances which have come to our knowledge and to the knowledge of the public. It seems that some shareholders complained of the doings of the company, and the Procurateur-Général investigated the matter, the result being, as we learn, that M. Gautier is now in prison on a charge of fraud. The accounts of the company, also, have been investigated by the public officials, and it has been shown that they were working at a loss of something like £60,000 or £70,000 a year. They were, therefore, not very proper persons to have entrusted to them the lighting of the town of Bordeaux. There is no doubt that the mayor and council of Bordeaux felt that a tender made by a company with an established name, though I can hardly say with an established reputation, was one they could accept. No doubt also they were misled. Since that date public affairs have changed considerably in France. The mayor and Town Council of Bordeaux have been removed from office, and a mayor has been appointed by the Government with an official *adjoint* to carry on the business. Meanwhile a fresh *cahier des charges*, *i.e.*, conditions of contract, had been prepared for a second public adjudication; and the present mayor and *adjoint* did not think themselves justified in not putting up the lighting under that *cahier*, although they had not much faith in its terms. We examined these conditions with the greatest care; we looked at them from every point of view, and the conclusion we arrived at is embodied in a letter which I propose to read to you, sent by our agent at Bordeaux to the mayor on the 7th of this month. It is as follows:—

Mr. Mayor,—The Imperial Continental Gas Association, having determined that they could not participate in the adjudication announced for the 10th of this month, considers it desirable to point out to you the reasons that have compelled them to adopt this resolution.

When I had the honour of addressing to your honourable predecessor, on the 13th of March last, the letter by which, in the name of the association, I undertook to deliver over to the future contractor the whole of their materials at the valuation of experts, one might have supposed that the *cahier des charges*, which was to be published after long and careful consideration, would render the adjudication possible, which the association on their part endeavoured to facilitate, and in which they had the intention of participating.

But this *cahier des charges*, drawn up for the first time on the 1st of May following, and definitely agreed to on the 28th of August last, appeared to us, as soon as we became acquainted with it, to be absolutely unacceptable.

It is not for us to discuss the terms of it. Finding therein unlimited conditions, insufficient guarantees, and directions impossible of execution, we could do nothing but relinquish taking part in the adjudication.

The association could not accept the position in which the literal application of the clauses of the *cahier des charges* would have placed them. They would not submit themselves to a law which appeared to them neither equitable nor practicable.

We sincerely regret to have been obliged to come to this decision. We should be sorry to see our connexion, that has existed so long, come to an end, and you may rest assured that the town will always find us well disposed towards them, should circumstances still require it. Of this we believe that we have already given abundant proof.—I have the honour to remain, sir, your very obedient servant,

(Signed) THEODORE BOUSCASSE,
Agent of the Imperial Continental Gas Association at Bordeaux.

The result of the adoption by the mayor of the terms proposed was, that nobody who had any knowledge of gas whatever thought it possible to send in a tender. All the gas authorities were of the same opinion as ourselves, that the conditions of the *cahier des charges* were impossible of fulfilment, and would not undertake the public lighting of the town; but when the adjudication took

place, to the astonishment of everybody connected with gas business, a financial company offered to accept the lighting of Bordeaux on the terms of the *cahier des charges*. What information they obtained, and who assisted them in it, I do not know; but as far as I have had experience in the nature of this business, I venture to tell them that they have undertaken something which is absolutely impossible of execution, and which must inevitably involve them and all connected with them in loss and disaster. I will just read you a few lines from *Le Gaz*, the principal gas paper in France, which expresses the opinion of persons well able to judge with regard to the acceptance of this *cahier des charges* by a financial company having no experience in gas-making. In the number for the 15th of the present month *Le Gaz* says:—

Lighting of Bordeaux.

Our expectation has been deceived. We had prophesied that no contractor would present himself at the mayor's office on the 10th inst., to tender for the lighting of the town with gas, subject to the *cahier des charges* from which we have given extracts in our number for the 15th of October last. One has been found, and one only, the "Société Financière de Paris."

The reduction offered by them on the term of the concession was eleven years and six months, which reduced the actual concession to twenty-eight years and six months from the 1st of January, 1876!

The "Société Financière" has been declared contractor. Such is the result of a question that has made so much noise.

The "Société Financière" is a joint-stock company with a capital of 40,000,000 francs; the offices of the company are at No. 19, Rue Louis le Grand, Paris.

We are not aware of their having, up to the present time, had to do with gas business; the Bordeaux undertaking would, therefore, be their *début* in our trade; but whatever may be the special talents of those with whom they have connected themselves for the purpose of conducting this affair, we cannot refrain from observing that for a *début* the acceptance of the Bordeaux *cahier des charges* appears to us, to say the least, *very rash*.

Well, gentlemen, as you will have seen in the letter and report, we came to a conditional agreement some time ago with the mayor and Town Council that if we did not compete for and obtain an adjudication of the contract for lighting Bordeaux we would sell our works, and it was one of the conditions that the new contractors should buy them at a fair valuation. Therefore, as the *Société Financière de Paris* appears to be a company of considerable capital, we shall not be damnified, for we shall have the full value of our property; but certainly the persons who have gone in for that undertaking will regret the result of their confidence in the *cahier des charges*, which we believe to be utterly impossible of fulfilment. I think now I have explained to you the exact position of affairs at Bordeaux, and I assure you again that all this business and the business at Vienna, as well as the general management of the association, has caused more work to be thrown upon us than I remember during the whole of the seven years that I have been a director, and I certainly do not desire to go through the same again. Not only has there been the business to attend to, but the amount of responsibility has been very great, for almost daily we had to come to most important decisions in conducting this correspondence. I think I have now stated all that is necessary to be said in reference to the stations. Returning to the affairs of the last half year, I may remark that the latter part of the report refers as usual to the question of profit. It has been pointed out that the profit is less by £34,000 than the profit of the corresponding half of the previous year, and I have explained to you the reason for it—viz., that the coal cost us a much larger sum, and that our coke realized a much smaller sum. If those circumstances were likely to continue, the directors, however, anxious to maintain the dividends, both for the sake of others and for their own sakes, seeing that they are by far the largest shareholders of the company, would have felt it their absolute duty to recommend the payment of a reduced rate on the present occasion. But they consider the last half year to be the very worst for many years past, and they believe, from the accounts they have received of the working of the current half year, as far as it has gone, that there is every probability, although the results may not be so good as in many half years preceding, that it will show some rebound and improvement. Under these circumstances, as they have always been anxious to divide every penny they could reasonably appropriate, after having paid due regard to the requirements of the business, and after considering also that they have not a freehold in all their stations, as some English companies have, they have come to the agreement that they would propose to you the same dividend as on the last occasion. Although the actual amount of profit, considering the expenditure absolutely necessary, hardly appears to justify it, yet, the prospects appearing better, we thought it right not to vary the dividend, and shall therefore propose the payment of £1 15s. per share—the same as in the past half year. It only remains for me now to make one other remark. At the commencement of the proceedings I stated to you that the circumstances were most extraordinary under which I am called to preside to-day. Our chairman, who has done a great deal of work, had a serious attack of illness in the spring of the year, and, though he can hardly be said to have thoroughly recovered from it, he has, during the protracted negotiations in which the board have been engaged, given the greatest possible attention to the affairs of the company. And now there are domestic reasons for his absence—he is compelled to go away for a short time. I may mention also that two other directors have been called away again from us by death, and I think I ought to tell you that one of our most excellent and efficient members, Mr. Henry Wood, who gives most unremitting attention to every detail, not only of gas-making, but of all the working of the association, has been obliged from temporary indisposition to go to the south of France. From these unavoidable causes, therefore, we appear before you to-day as a very small body of directors. At the same time, I think it right to assure you that all the matters I have referred to have received the careful consideration of the board as a whole, and that what I have stated to you is generally the opinion of the directors. Having said these things, I must ask you to kindly forgive any shortcomings of mine, as I have never before presided at one of your meetings. It only remains for me to say, as the chairman has always said on previous occasions, that any questions that can be answered without injury to the interests of the association I shall be happy to reply to. I beg now to move the adoption of the report.

Mr. Turner seconded the motion.

A Shareholder: At the last meeting the shareholders were informed that the company were under deep obligations to their agent and engineer at Bordeaux. I should like to know whether those services have been rewarded in any other way than by a formal vote of thanks.

The Chairman: The agent and engineer at Bordeaux have fixed salaries, and as all this business has been continuous, the board have not come to any decision as to any extra reward, nor do they think it desirable until the business is actually concluded. When that is done, we shall endeavour to do what we think fair and just to these gentlemen, bearing in mind at the same time the interests of the proprietors.

The motion was put, and carried unanimously.

The Chairman: The next resolution is—"That a dividend of £1 15s. per share on the 56,000 shares of the association be declared for the half year ending the 30th of June last, and that the same be payable, free of income-tax, on and after the 15th of December next, as recommended in the report."

Mr. Bassett, M.P., seconded the motion, which was put and carried.

The Chairman: This is the whole of the business. I may say that we have given you the most careful statement in our power; and, though there are some circumstances which are not so satisfactory as we could have wished, there are others which afford ground for encouragement in the future. I am much obliged to you for your attendance.

A Shareholder: May I ask in what way the vacancies at the board have been filled up?

The Chairman: Mr. Attwood only died on Sunday, and, of course, it would not have been respectful on our parts to take any steps to fill up that vacancy. With regard to the vacant seat through the death of Mr. Palmer, the board have been considering the question, and have not yet arrived at an absolute conclusion. As I before stated, the duties of a director of this company are most onerous, and any one who comes on the board must be prepared to give a vast deal of time and attention to the business. There are times when a director may be required to rush off to the Continent almost at a moment's notice. He ought to be a person of considerable business tact and faculty, and, if possible, one who possesses a knowledge of French and German. It is also desirable, if possible, that he should have a considerable pecuniary interest in the company. And when I say that, as boards now go, the remuneration is anything but large, you will admit that he will not have a very easy task. We are endeavouring to find a gentleman who has the time and ability to serve the company, and when we nominate such an one, we shall give our reasons for doing so if required. At present nothing has been done.

Mr. Bassett: I beg to propose a vote of thanks to the chairman and the directors. I am very glad they have had nerve enough to keep up the dividend.

A Shareholder seconded the motion, which was unanimously adopted.

The Chairman: Gentlemen,—We are glad that you approve of our proceedings. We have had, as I told you, a most anxious time, and I hope we may never have so much anxiety again. I think, before we separate, we should observe the usual custom, and pass a vote of thanks to Mr. Drory and the officers and agents on the Continent, for their constant and persevering attention to our business. I move that resolution.

Mr. Newton seconded the motion, which was carried unanimously, and the proceedings terminated.

BOMBAY GAS COMPANY, LIMITED.

The Half-Yearly Meeting of the Shareholders of this Company was held at the Terminus Hotel, Cannon Street, London, on Thursday, Nov. 26—D. T. Evans, Esq., in the chair.

The Secretary (Mr. W. Marshall) having read the notice of meeting, the following report and statements of account were presented:—

Your directors have pleasure in submitting to the shareholders a statement of accounts, duly audited, for the half year ending the 30th of June last.

During this interval the progress of the company has been satisfactory. There has been an increase in the gas and meter rental, and a decrease in the cost of production; whilst the sale of residual products shows an advance, and there has been a fair profit on fittings.

After consideration of the question raised at the last ordinary meeting of the company as to the period for payment of the dividends, your directors have determined to hold the half-yearly and ordinary meetings respectively a month earlier than heretofore; and to pay the several dividends on the 1st of June and 1st of December, instead of the 1st of January and 1st of July in each year.

Taking advantage of the low rate of freight for Bombay, and the decline in the price of coal, your directors have now in stock, afloat, and ordered, a quantity of coal equal to the consumption for a very considerable time—a fact of great importance as regards the future.

The accounts show a net profit for the half year of £12,241 16s. 6d.; and, after appropriating £2900 to the reserve-fund, your directors declare a dividend, free of income-tax, at the rate of 3½ per cent. for the half year, leaving a balance of £723 1s. 5d. to be carried to the credit of the current half year.

The dividend will be payable on and after the 1st of December next.

Dr. *General Balance-Sheet, June 30, 1874.* *Cr.*

Capital authorized—				Construction account		£198,931	5 8
(50,000 shares, at £5 each—£250,000.)				Goods *in transitu*		931	10 11
40,000 shares, £5 paid		£200,000	0 0	Services account		104	4 7
10,000 „ £4 paid		40,000	0 0	Retort account		1,107	13 7
Debentures		19,350	0 0	Stock in trade, viz.—			
Amount owing by company		1,070	13 5	Chandeliers, brackets, &c.		6,485	9 0
Dividend		9,600	0 0	Brass and iron goods, tubing, &c.		5,924	19 3
Reserve-fund	£5,217 6 6			Materials, mains, and services		1,656	8 10
Added this half year	2,900 0 0			Meters		2,869	2 8
Old materials sold	140 9 1			Coal		9,148	5 8
	£8,257 15 7			Coke		180	8 0
Written off depreciation	1,548 0 5			Tar		122	18 6
		6,709	15 2	Tools and sundries		754	10 0
Insurance-fund		839	11 5	Amount owing to the company		6,461	10 6
Passage-fund		240	0 0	Cash at bankers, on deposit, and in hand		*23,254	14 3
Balance to general revenue		9,123	1 5	Indian Government 4½ per cent. Loan, 1872		*7,000	0 0
				Bankers bills in hand		*22,000	0 0
		£286,933	1 5			£286,933	1 5

* From the total of these (£52,254 14s. 3d.), £9600 dividend was paid on July 1, 1874.

Profit and Loss Account, for the Half Year ending June 30, 1874.

Coal carbonized		£6,964	0 3	Gas and meter rental		£19,093	0 10
Wages		1,059	14 0	Coke		4,623	9 0
Purifying		43	4 10	Tar		666	9 6
Maintenance of retorts		215	10 8	Fittings		915	16 3
Trade and general charges		1,346	15 6	Interest		59	1 6
Salaries and collectors commission		1,678	17 5	Transfer fees		19	5 1
Rents, rates, and taxes		346	12 11				
Directors and auditors remuneration		676	5 0				
Bad debts and allowances		30	11 10				
Law expenses		119	14 0				
Exchange		653	19 3				
Net profit		12,241	16 6				
		£25,377	2 2			£25,377	2 2

General Revenue Account, June 30, 1874.

Dividend for half year ending Dec. 31, 1873		£9,600	0 0	Balance on Dec. 31, 1873		£10,061	14 11
Interest on debentures		580	10 0	Net profit for half year ending June 30, 1874		12,241	16 6
Amount carried to reserve-fund		2,900	0 0				
Written off preliminary expenses account		100	0 0			£22,303	11 5
Balance carried down		9,123	1 5	1874, July 1.—By Balance brought down		£9,123	1 5
		£22,303	11 5				

The Chairman: Gentlemen, the directors have much pleasure in meeting the shareholders upon this occasion, especially as they can refer with satisfaction to the condition of the company. Our course has not been very rapid, but it has been sure. It has not been my custom at the half-yearly meetings to go so elaborately through the accounts as I do at the annual meetings, for this reason, that the interval between the two is so short that it would hardly permit an useful comparison; I shall, therefore, refer only to one or two points in the balance-sheet, unless further particulars should be asked for by the shareholders. If you look to the profit and loss account, you will find that the whole of the items are on the favourable side. The "Gas and meter rental" for the half year ending June, 1873, was £18,856; last year it was £19,093, showing an increase of £237. Sales of coke to June, 1873, amounted to £4098; in the half year under review they amounted to £4623, showing an increase of £525. Tar sales, in June, 1873, amounted to £116; last half year, £666; showing an increase of £550. Profit on fittings, which

in June, 1873, amounted to £379, last half year were £915, showing an increase of £536. Our reserve-fund last year stood at £4320; it now stands at £6709, although we have written off for depreciation £1548, making nearly £3000 in the year. We have added to the reserve-fund this half year £2900, making £4900 for the whole year. Upon the recommendation of the auditors, the board have commenced writing off a small sum on "Preliminary expenses account." Clause 106 of the Articles of Association might be interpreted to involve an obligation on our part to do so, but, whether this be so or not, we have commenced doing so. No doubt the shareholders, looking at the balance-sheet, will be much struck with the large sum of money we had in hand in Bombay and at home last June—£52,254—and some might think that a portion of that sum should be distributable. But I will at once disabuse your minds on this point. You will remember that, some years ago, the Municipality of Bombay, having accepted two bills for gas supplied by the company, amounting to £10,000, made default—the bills were dishonoured. We found ourselves at that time in a difficulty for want of that money; it was, in fact, a part of our working capital, and we had to borrow on debentures £20,000. Out of the £52,000 we had in hand on June 30 last we have to pay off debentures amounting to nearly £20,000, and as the dividend we propose to declare to-day will require £9600, there will only be about £20,000 left for working capital. A large portion of it has been already appropriated in the purchase of coals. And, as I have mentioned the subject of coals, it will be assuring to you to know that we have in store, afloat, and under charter a sufficient quantity for two years supply. You will remember that we took advantage two years ago of low freights and the low price for coal. By this step we were enabled to tide over the subsequent enormous rise in the market; so that, to use a City phrase, we "sat on velvet" through the whole time. We are now taking a similar advantage. Freights are low, and coals are much lower than they were, though not so low as they formerly were. When we made our purchases two years ago they were at 6s. 6d. per ton, now they are 11s. 6d.; but they have been as high as 18s. or 20s. I have little further to add, except to inform you that our works are in good condition, that we are on very good terms with the municipality and all parties in Bombay, and that our prospects are favourable with respect to the current half year. With these remarks I move the adoption of the report.

Mr. LYSLEY seconded the motion.

Mr. STOKES said the chairman having informed the meeting that the directors were shipping English coal to Bombay, he thought he might ask for information as to whether any steps were taken to insure the cargoes. He knew that English coal was liable to explosion, and he had recently heard of a destruction of coal by fire at the Dublin Gas-Works. He should be glad also of some information on the question of leakage.

The CHAIRMAN said the directors only insured for the actual value of the coal and freight. He did not apprehend there was really much danger of spontaneous combustion or explosion on board ship. With reference to leakage, it was a little higher last half year than at this time in 1873. It now amounted to 10 per cent., but the directors were having the whole of the services carefully examined, and were carrying out renewals at considerable expense. One of the gasholders had been getting rather leaky, and was at present, he believed, under repair. Mr. Scott, the engineer and manager, was anxious that the repairs should be completed in the cold season, but some little delay had been caused by the non-arrival of the plates; they are, however, now in Bombay, and the repairs, no doubt, in progress.

Mr. STOKES said his remarks about insuring coal referred to its insurance after it was received into stock at Bombay.

The CHAIRMAN said the company had had some experience with the spontaneous combustion of English coal in store, but nothing of the kind had occurred with the Australian coal, though much was stacked in the open. Every suggestion for preventing mischief, by ventilating shafts and otherwise, had been adopted. He did not know whether it would pay to insure against such contingencies.

Mr. H. P. STEPHENSON said no doubt insurance companies would take the risk, but he questioned whether it would answer the purpose of this company to insure. Australian coal would store very well, and the directors had given instructions to their manager in Bombay, that the English coal should be used up as soon after arrival as possible. Another precaution was to store all coal in separate stores, so that in the event of a fire only a portion of the stock would be endangered. The rate of insurance against spontaneous combustion would be rather heavy, and from his own experience he should say that the company would be losers by the transaction.

A SHAREHOLDER suggested that the manager's report to the board as to the position of things in Bombay should in future be printed with the directors report.

The CHAIRMAN said it had not been the custom to do so, but he had generally read extracts from it to the shareholders.

A SHAREHOLDER asked whether the value of the chandelier and bracket stock had been accurately taken, and whether the "amount owing to the company" might be taken as good debts.

The CHAIRMAN said the bad debts made by the company were almost nominal. It was the practice in Bombay to pay accounts monthly. In the half year under review, the bad debts amounted to only £30, which on a rental of nearly £40,000 a year could not but be regarded as small.

A SHAREHOLDER asked, with reference to residual products, whether it was likely they would increase in value.

The CHAIRMAN said it was impossible to utilize the ammoniacal liquor in Bombay, as was done on this side. The directors believed they did not make enough to justify the erection of apparatus to manufacture sulphate of ammonia. The coke and tar results were up to the present time most satisfactory.

The motion was put, and carried unanimously.

A vote of thanks having been given to the directors,

The CHAIRMAN acknowledged the compliment, and said the directors shirked no labour and spared no pains in carrying on the business of the company, and it was gratifying to them to receive the assurance that their efforts met with the approval of the shareholders.

On the motion or Mr. STOKES, a vote of thanks was passed to the secretary and to the engineer and staff in Bombay.

The SECRETARY (Mr. Marshall) responded, and the proceedings were brought to a close.

ORIENTAL GAS COMPANY, LIMITED.

The Annual Meeting of the Shareholders of this Company was held at the Terminus Hotel, Cannon Street, London, on Thursday, Nov. 26—WALTER THOMAS FAWCETT, Esq., in the chair.

The SECRETARY (Mr. A. Hersee) read the notice of meeting, and the following report and statement of accounts were presented:—

The directors have pleasure in submitting to the shareholders the audited accounts for the financial year ended on the 30th of June last, and in reporting that the affairs of the company have, during the above period, made favourable progress.

There has been a satisfactory increase of public lighting, consisting of 44 additional lamps erected in Calcutta and the suburbs, and 39 extra lamps at Howrah. Negotiations have been commenced for a further extension of the public lighting at Howrah, consequent upon the powers now possessed by the municipality to levy the lighting-rate alluded to in last report.

The increase of private lighting is also encouraging. During the twelve months applications for gas have been received from 64 new consumers, and 1937 additional burners have been fitted. The total numbers of lights on the 30th of June last (including Howrah), were—Public 3491, private 34,059, compared with, respectively, public 3408, private 32,122 at the corresponding date in the previous year. The new theatre is about to be lighted up, and orders are expected for the laying on of gas to the Government telegraph office and other buildings. The number of bazaar lights in use on the 30th of June last, was 648.

The construction of the floating bridge across the River Hooghly, connecting Calcutta with Howrah, is at last completed. Though not possessing the advantages of a permanent structure, the bridge will, your directors believe, be the means of increasing the importance of Howrah, by affording safer and more direct communication with the capital, whereby the interests of this company are likely to be advanced.

The works and machinery at Calcutta and Howrah have been maintained in thorough efficiency, and since last report some important additions to the plant have been effected. The new engines and exhausters were erected and set in motion at the end of April last, and their working has proved highly satisfactory. A new retort-bench for the reception of 35 through retorts has been completed ready for use in the ensuing cold season. A supplementary trunk main, 18 inches in diameter, has been laid from the works to the town, affording an improved delivery of gas in all the districts lighted by the company. Additional purifying and condensing apparatus and a new station-meter have been ordered, to meet the growing requirements. The heavy expenditure involved in the above extensions has been undertaken with the view of ensuring to the consumers an efficient supply of gas of good quality.

The work of main-laying has been actively carried on, upwards of 6 miles of cast-iron pipes having been laid during the year. The water and drainage operations of the municipality continue to injure the mains and services of the company, but, as the heavier portion of this work is approaching completion, there is reason to hope the damage will diminish.

The members of the resident committee (Messrs. E. Broughton, R. C. Noble, and H. W. J. Wood) continue to evince a warm interest in the welfare of the company, and the company's staff have spared no efforts to promote the success of the undertaking. The engineer and manager, Mr. Blackburn, having fulfilled the term of his first agreement with the company, has recently visited England; the directors have improved the opportunity of personal communication with him, and are confirmed in their favourable opinion of his ability and character. The shareholders will be glad to learn that Mr. Blackburn has renewed his engagement for a further period, and returned to his duties. It is right to mention, that during the absence of the engineer and manager, the business of the company has received the efficient and careful attention of Mr. Hickling, the deputy-manager.

The general revenue account shows a balance of £13,383 14s. 10d., out of which the directors recommend a distribution of 5½ per cent., free of income-tax, payable on the 4th day of December next, making, with the interim payment of 4 per cent. on the 4th of June last, a total dividend of 9½ per cent. for the year.

The directors who retire by rotation are James Sydney Stopford and William White, Esqrs., and the retiring auditors are Henry M'Lauchlan Backler and Thomas Newton Stokes, Esqrs., all of whom are eligible for re-election, and offer themselves accordingly.

Balance-Sheet, June 30, 1874.

Dr.				*Cr.*			
30,000 shares of £5 each.	£150,000	0	0	Amount of plant on the 30th of June, 1873	£258,316	2	6
30,000 do. (50s. paid)	75,000	0	0	Outlay during the past 12 months	9,389	17	0
	£225,000	0	0				
Loans on debentures	71,570	0	0	Cost of plant to the 30th of June, 1874	£267,705	19	6
Unclaimed dividends	535	15	7	Services laid and meters in use	5,097	11	9
Reserve-fund	7,480	6	8	Amount due to the company	5,825	0	8
Amount due by the company	2,976	5	2	Value of stocks, viz.—			
Balance from general revenue account	13,383	14	10	Coals	3,634	2	4
				Purifying material	521	15	7
				Products	1,071	12	1
				Fittings and meters	6,940	10	8
				Pipes	6,266	7	5
				Horses, conveyances, &c.	460	0	0
				Sundry stores	5,950	8	7
				Office furniture, &c.	398	4	7
				Balance in London	3,852	19	8
				Bills receivable	12,321	9	11
	£320,946	2	3		£320,946	2	3

Profit and Loss, for the Twelve Months ending June 30, 1874.

Manufacture and distribution—				Gas-rental	£45,343	0	11
Coals used, purification, and wages	£19,666	16	4	Coke, tar, fittings, &c.	12,956	8	10
Salaries in India & London	2,606	11	0		58,299	9	9
Directors and auditors	913	0	0	Transfer fees	16	2	6
Passage & general expenses	1,221	4	3				
Exchange	1,970	9	3				
Reserve-fund	1,070	9	10				
Mains account	2,764	1	0				
Wear and tear and repairs	2,202	15	6				
Bad debts and allowances	140	9	2				
	£32,575	16	4				
Balance	25,739	15	11				
	£58,315	12	3		£58,315	12	3

General Revenue Account, June 30, 1874.

Dividend of 5 per cent. balance of 9 per cent., for the 12 months ending the 30th of June, 1873, declared at the general meeting, November, 1873	£11,250	0	0	Balance on the 30th of June, 1873	£11,770	6	5
Interim dividend of 4 per cent., on account of year ending the 30th of June, 1874, paid June 4	9,000	0	0	Do. on profit and loss account	25,739	15	11
Interest on debentures	3,591	1	3				
Income-tax	285	6	3				
	£24,126	7	6				
Balance	13,383	14	10				
	£37,510	2	4		£37,510	2	4

The CHAIRMAN moved the adoption of the report and accounts. He said: In looking over the report, and considering the state of our company, I think it will only be necessary for me to say a very few words. It is, in all probability, because the shareholders generally are of the same opinion, that we have so small an attendance here to-day, and they do not think there is very much more information to be gleaned than they can find upon a perusal of the directors report. I may say generally that we are making progress in all respects, and we are able to do, upon the present occasion, that which I am sorry to say we have not done for some years before this—increase the rate of dividend to our shareholders. I hope this will be satisfactory to you as an indication of what we hope will yet be a matter of frequent occurrence. Our private and public lighting is increasing. We have, as you know, an additional station in Howrah, on the other side of the Hooghly, and the success of it is now beginning to be felt materially. A lighting-rate, as you are aware, has been proposed and carried into effect, and no doubt we shall begin to feel the benefit of that in a short period. Public lighting, after a lapse of years such as we have passed over, will necessarily be a comparatively slow matter. The private lighting is increasing at a moderate but still a very satisfactory rate. It will be interesting to you if I state that in going through the accounts I find that we have as many as 1215 lights taken by 12 consumers. There is one consumer who takes 300, another 154, and so on. A place that can do that must be in a very satisfactory condition, and we cannot look upon it as a bad place for business. My own impression is that we are at the beginning of a very large increase in the private lighting. The Hooghly bridge, as you are aware, is finished, and we look upon that as a great advantage to us.

There is no doubt that all the danger and discomfort of the ferry to which we were previously exposed is now over, and we shall have an increase of our business on account of the connexion now established between Howrah and the capital. Our works, I am happy to state, are in most excellent order—they never were in a better state. There are inconveniences about them, but their condition is very good. The new engine and exhausters are entirely successful in reducing the consumption of fuel, but as to our mains and the state of our leakage, we cannot so much congratulate ourselves. The drainage works are still progressing, and the difficulties which have so long beset us from them continue, but we are looking forward to an early cessation. We have had the advantage during this year of the presence in England of our engineer and manager, Mr. James Blackburn, and we took advantage of his visit to have frequent personal communications with him. We can truly say that the reasons which influenced us in the first instance, in engaging that gentleman, have been fully justified; he has turned out to be exactly the man we expected. He has now served his first term of five years, and has signed an agreement for a further term of a similar nature. The fact of our entering into this agreement is a proof of the confidence we have in him. He has served us well and truly in the past, and I am quite sure, from what I have seen of him, that he merits our most complete approbation. With these remarks I move that the report and accounts be received and adopted.

Mr. WHITE seconded the motion.

General RIGBY: May I ask what is the per centage of leakage in this company?

The CHAIRMAN: It is about 29 per cent.

General RIGBY: In the Bombay Gas Company it is only 10 per cent.

The CHAIRMAN: At Bombay there is an altogether different kind of soil to work in, and perhaps there the company have not had the disturbances of their mains from sewerage works as we have. Over and over again the streets in Calcutta have been taken up, and our mains have been greatly damaged thereby. That is the chief reason why our leakage is so high as 29 per cent. The secretary also reminds me that our mileage of mains is very large—120 miles—and they are laid in a very shifty and uncertain soil. Indeed, I think, upon the whole, our leakage is as little as, under the circumstances, we could expect.

The motion was put, and carried unanimously.

The retiring directors and auditors having been re-elected,

The CHAIRMAN moved—"That a dividend of 9½ per cent., for the twelve months ending the 30th of June last, be declared, and that the same be paid to the shareholders free of income-tax, on the 4th proximo, less 4 per cent. paid on the 4th of June last."

Mr. STOPFORD seconded the motion, which was put and carried

The CHAIRMAN moved—"That the thanks of the shareholders be given to the Calcutta committee for their attention to the local affairs of the company during the past year." This, he said, is a resolution generally proposed at our annual meetings, and I can truly say, as one of your directors, that the committee have rendered us very great and valuable service. We are indebted to them for a great deal of the best management of our affairs, which their residence on the spot enables them to give. I have, therefore, very great pleasure in proposing this resolution.

Mr. FISHER seconded the motion.

Mr. STOKES: As one of the auditors of the company, I have had some experience of the manner in which the accounts are sent over from Calcutta, as supervised by these gentlemen, and I can assure the meeting that I bear my testimony most heartily to the satisfactory way in which those accounts reach us. The committee take a warm interest in the welfare of the company, and are doing all in their power to promote its prosperity.

The motion was adopted.

The CHAIRMAN: I have already referred to our excellent engineer and manager, who has just fulfilled his first term of five years to our entire satisfaction, and I shall be glad if, at my instigation, the shareholders will pass a vote of thanks to him, and express their approval of his services. I was happy to find, when he was in England, that his health was thoroughly good. He has now returned to enter on a second term of five years, and I am convinced that his duties will be honestly and zealously performed. I move a vote of thanks to him.

Mr. WHITE seconded the motion, which was carried.

Mr. BADDELEY moved a vote of thanks to the directors for their attention to the affairs of the company.

Mr. GODSON seconded the motion, which was put and carried.

General RIGBY: I think a vote of thanks is also due to our secretary. A great deal of the good management of the company depends upon him, and though I have not the pleasure of a personal acquaintance with him, I know that he most efficiently performs his duties. We are receiving an increased dividend, whereas in the majority of gas companies it is the reverse, and I think, therefore, that a bare vote of thanks to our secretary is not enough, and, therefore, I propose that it be accompanied with a present of 50 guineas.

Mr. STOKES: I shall be happy to second the vote of thanks, but with respect to the present I think we had better leave the matter in the hands of the directors. We all acknowledge the value of the services of the secretary, and I am quite sure the directors will not let them pass unrewarded.

The CHAIRMAN: There can be no one more anxious than the directors to mark in a fitting and proper manner their sense of the way in which the duties of the secretary are performed. No one knows better than he does himself how anxious the directors are at all times to put him in a proper position. But I would suggest that the present motion should end with the vote of thanks, and I am sure the secretary himself will be but too glad to be left in the hands of the directors. I may take this opportunity, on behalf of myself and colleagues, to acknowledge the kind way in which you have referred to our services. I have been suffering from illness lately, and I assure you that to come back amongst those with whom I have been long associated to receive this compliment is very acceptable to me.

The vote of thanks to the secretary was then put and carried.

Mr. HERSEE: I beg to thank General Rigby and the chairman for their kind expressions respecting my services. This is the 15th anniversary of the company at which I have stood before you as secretary, and it marks 15 years pleasantly and happily spent in your service. I have every reason, as the chairman says, to be grateful to the directors for their consideration to me in the past, and to feel quite safe in their hands. At the same time, I fully appreciate all that has fallen from the shareholders in reference to me. I do not need any stimulus, for my heart is in the work, but these expressions of approval are very encouraging to me. With reference to Mr. Blackburn, I may venture to assure you that he is deeply sensible of your recognition of the way in which he endeavours to discharge his important duties. I hear from him semi-officially sometimes, and know that it is a great gratification to him to receive these votes of thanks, and that they stir him up to exert himself to the utmost for the promotion of your interests.

IMPROVEMENT IN GAS-RETORTS.—A writer in the *Scientific American* says: "I have a wrinkle to impart to those of the gas fraternity who use clay retorts. It is well known that clay retorts, when first fired up, are very open and porous, causing considerable loss in the yield of gas; and the same thing happens when they become coated with carbon on the inside, and have been recently burned out. If those who use such retorts will, when they are new, coat them (both in and outside) with a solution of silicate of soda, of the consistence of ordinary syrup, the difficulty will be entirely removed. It is hardly necessary to add that the coating should be done before setting, and allowed to dry thoroughly."

BAHIA GAS COMPANY.

The Ordinary Meeting of this Company was held on Thursday last, at the Company's Offices, Coleman Street—C. NICHOLSON, Esq., in the chair. It was preceded by an extraordinary meeting, at which the resolutions adopted at a meeting held on Oct. 29 were formally confirmed.

At the ordinary meeting the following report of the directors was taken as read:—

The directors herewith present the statement of accounts and balance-sheet for the half year ending June 30, 1874. It has been the most trying period within the history of the company, arising solely from the extraordinary price of coals coincident with unusual high rates of freight. The cost of coals carbonized for the half year is £8615 1s. 8d. For the corresponding half of 1873, the cost of coals was £5311 14s. 8d., being £3303 7s. in excess. This difference represents more than 3 per cent. for the half year on the whole ordinary capital of the company. All the other items of charge compare favourably with the previous statements; and the revenue receipts exhibit a progressive augmentation. Happily there is an end, for the present at least, to the adverse circumstances aforementioned. The price now being paid for coals is nearly 40 per cent. below the range of prices that prevailed a year ago. The directors recommend, on this statement of accounts, the payment of dividends at the rate of 10 per cent. per annum, and 7½ per cent. per annum respectively on the two classes of preference shares. After which there will remain a balance to be carried to the next account of £1064 17s. 8d. As £406 2s. 9d. was brought forward, and £1064 17s. 8d. is now carried to the credit of the next revenue, it follows that there has been earned this half year, notwithstanding the exceptional cost of coals, £658 14s. 11d. more than is necessary to meet the preference obligations.

The Provincial Government of Bahia has not yet paid the amount awarded by arbitration in September, 1873, which, with interest, amounts to nearly £4000. The company has other, and some still larger, claims against the Government, and the directors have given notice that they intend to take energetic steps to enforce the rights of the shareholders.

The directors who go out of office on this occasion are Mr. Joseph Quick and Mr. Cornelius Nicholson, who are eligible for re-election. The auditor retiring, Mr. Magnus Ohren, is likewise eligible for re-election.

Dr. *Balance-Sheet, June 30, 1874.* *Cr.*

Capital—			Concession		£7,000 0 0
5000 ordinary shares	£100,000	0 0	Investment		91,091 5 2
1000 preference, 10 per cent.	20,000	0 0	Additional during half year—		
1500 ditto, 7½ ditto	30,000	0 0	Extension of retort-house	1,214 6 7	
	£150,000	0 0	Lamps, mains, &c.	163 13 9	
Creditors—			Freehold land	4,705 2 7	
Shares pending redemption	5,420	0 0	Meters fixed	3,114 3 6	
On open accounts	795 19 9		Office furniture and fixtures	387 10 0	
On acceptances	2,697 4 2		Preliminary expenses	16,914 17 3	
Dividends unpaid	61 14 9		Due for gas, fittings, &c.—		
Profit and loss	3,262 17 8		Public lamps	4,380 2 10	
Insurance-fund	73 1 0		Ditto suspense account	3,586 1 6	
			Ditto establishments	2,871 9 9	
			Exchange, Brazilian Government	502 15 11	
			Private rental and fittings	4,974 15 0	
			Sundry accounts	266 4 9	
			Stock—		
			Coals	6,738 12 5	
			Coke	225 0 0	
			Turba	206 5 2	
			Fittings	5,526 17 0	
			Meters	347 18 2	
			Mains, lamp-columns, and other materials	4,204 0 8	
			Goods in transit	830 18 9	
			Cash—		
			General account at bankers	721 3 9	
			Dividend ditto ditto	137 5 8	
			London office	4 1 3	
			Bahia ditto	47 10 4	
			London and Brazilian Bank	2,148 15 7	
	£162,310 17 4				£162,310 17 4

Revenue Account, for the Six Months ending June 30, 1874.

Coals carbonized	£8,615 1 8		Gas supplied to public lamps	£3,967 7 0	
Purifying materials	118 16 1		Less fines	271 16 0	
Carbonizing wages	1,035 8 3			£8,695 11 0	
Lamplighters wages	814 19 1		Private consumers	5,146 0 0	
Yardsmen, labourers, &c.	546 6 1		Public establishments	1,091 16 0	
Salaries	1,499 3 9		Meter-rental	487 16 4	
Directors fees (postponed)	—		Products	1,824 1 9	
Auditors ditto	21 0 0		Transfer fees	1 1 6	
Rent, taxes, and insurance	156 18 9		Profit on fittings	456 15 10	
Interest	102 10 4		Bad debts recovered	0 11 3	
Stationery	81 12 5		Profit on exchange	109 11 3	
Office expenses	46 1 4				
Keep of horses	55 9 4				
Trade charges	196 1 7				
Wear and tear	875 17 9				
Repairs and maintenance of public lamps	452 7 7				
Ditto of mains and services	164 2 11				
Travelling expenses	124 12 3				
Medical attendance	16 15 3				
Allowances	33 5 7				
Profit	2,856 14 11				
	£17,813 4 11				£17,813 4 11

Profit and Loss Account, June 30, 1874.

Dividend declared, April 30, 1874	£3,500 0 0		Balance of account to Dec. 31, 1873	£3,906 2 9	
Balance	3,262 17 8		Revenue account—net profit for this half year	2,856 14 11	
				£6,762 17 8	
	£6,762 17 8		Balance	£3,262 17 8	

The CHAIRMAN said: In moving the adoption of this report and balance-sheet, I have only one or two observations to make with reference to it. Even if it had not been pointed out in the balance-sheet, you would all see that the one disturbing element in this account—the pivot upon which the whole thing turns—is one exceptional item—the cost of the carbonization of coal. You are told in the report that the coals for this half year have cost £8615, as against £5311 in the corresponding period last year, showing an excess of £3303. I hope you do not require from me, on the part of the directors, any excuse with reference to this matter, because you know as well as I do that the directors have no more control over the coal market or over the rates of freight than they have over the weather; therefore we have really no excuses to offer to you for this disastrous state of the balance-sheet. We have to submit to what one may call *force majeure* which is entirely beyond our own control. All that we can say is that we are sorry that circumstances have been so adverse to the interests of the company in this matter, especially after the very great number of disasters that the company had exhibited. The only other item in the balance-sheet to which I think it necessary to call your attention is the cost of the extension of the retort-house, which is put down for this half year at £1214 6s. 7d. I wish to explain that, because I desire to be very candid with you on the question of the appropriation of money to revenue and capital. That item is only put to the capital account *ad interim*. The whole of the sum may not be chargeable to capital eventually, but in the meantime it can be put nowhere else. It is only a part of the expenditure of capital which is proceeding in the reconstruction of the works. We have now an engineer of great experience, Mr. Muriel, who has been long enough at Bahia

to ascertain the defects of the works, and he has suggested to the board their entire reconstruction. This item, then, is for work that is partly new and partly an extension and replacement of the old retort-house; and what we propose is this—when this sum, and others that may be added to it, come to be dealt with as between capital and revenue, all that fairly represents an extension of the works, all that can fairly produce fresh revenue, will be carried to capital, but that which is simply a replacement of old works will be carried to revenue. I believe that is the right principle. And speaking of the retort-house, there are gentlemen here who will understand me when I say that the profits of a gas company, wherever it may be situated, are either made or lost in the retort-house. Hitherto our retort-house has been very defective. Now that you have kindly given us new capital, we hope to make such use of it as to render it reproductive in succeeding accounts. In the revenue account, on the other side, there is one item which I wish to explain. You will see that, as the ordinary shareholders are to receive no dividends, the directors take no fees. We did not think it desirable to take our fees, but we wish to be candid with you, and to say that when the company is in a position to pay those fees, the directors will look to you to have them paid. They have worked hard, harder perhaps than if the company had been in a more flourishing state, and they do not think that they ought to go entirely without being paid; therefore they look to you to have those fees paid when the ordinary shareholders receive their dividends. There is a paragraph in the report to which I wish to allude: "The Provincial Government of Bahia has not paid the amount awarded by arbitration in September, 1873, which with interest amounts to nearly £4000. The company has other and still larger claims against the Government, and the directors have given notice that they intend to take energetic steps to enforce the rights of the shareholders." It is more than a year since the arbitrator awarded to this company a sum which with interest would amount to nearly £4000, and yet we cannot get the money. The general manager in Bahia has been repeatedly to the president of the province, urging him to pay this sum, which is justly due, and cannot be resisted, yet so far we cannot force them to pay. It would be very natural if any shareholder at this meeting were to ask me what is meant by the "still larger claims;" how much can the company claim from the Government in respect of all the open questions between them? The answer is, it cannot be less than a sum ranging between £15,000 and £20,000. I think it will be nearer £20,000 than £15,000, if the company gets all that it is entitled to. I can imagine how lugubrious faces in this room would be changed into smiles if a sum of £20,000 were at once to drop into the exchequer. That would be a godsend such as the company has not had in its history; but it is as much our due as the £4000 that has been awarded to us by arbitration. There are four distinct claims that we have against the Government, and the equity of the claims is as clear to any man of business—to any independent, impartial mind—as is that of the sum of £4000 to which I have referred. I cannot tell what the conduct of the Government has been with reference to this company. I can only say that it has been oppressive in the last degree from the moment that the company was established until the present time, and it is probable that some of the influential shareholders will be asked by the board of directors, whoever they may be, to co-operate with them in measures that it may be necessary to take to enforce the rights of the company against the Government of Bahia. I will not indicate what those measures may be; but you have been already told in the report that notice has been given to the Government that energetic steps will be taken to enforce the rights of the company. We shall see what answer they make to the communication, and to the warning given them that the company will no longer submit. I have now only to move the adoption of the report.

Mr. PADDON, in seconding the resolution, said it would be out of place to confess to anything like a feeling of disappointment. When he heard that no advance had been made in the price of gas, he was quite prepared to receive a statement announcing that there would be no dividends at all. Things might turn out very badly; but when they were not as bad as was expected, a feeling of relief was experienced, and he was certainly relieved when he found that the company was able to meet its preference obligations. He thought that attention ought to be drawn to the favourable features of the account, as well as to those which were not favourable. He observed that there was a considerable improvement in regard to the expenditure on other items than coals. It would be well that the manager, who had not been long in the company's service, should understand that the proprietors would henceforth take a very keen interest in matters that were fairly under the control of the executive of the company. They would be quite ready to give him credit for all good results, and probably they would not hold him irresponsible with regard to bad results. He had no doubt that the improvement that had set in would be carried still further, and, if so, it would be hailed by many with the greatest pleasure, and the manager himself could not fail to be pleased and rewarded by the expression of the satisfaction of the proprietors.

Mr. MAUDE said that the chairman had not explained how long the claims referred to had been outstanding. They appeared to have been going on a long time, and he wished to know if the company had lost the right of enforcing them by its own *laches*.

The CHAIRMAN: We have not committed any *laches*. We have been constantly pressing our claims. The board has written, and the general manager has written repeatedly, pressing upon the Government for the payment of these sums.

Mr. MAUDE: Have you any objection to tell us the nature of the claims?

The CHAIRMAN: The first is a claim for £500, arising from the equivalent of the par of exchange in gold—money due from public establishments for lighting. The Government at first refused to pay at the equivalent of gold, according to the contract. They found that they were wrong, and that they could not go on enforcing their views with reference to this matter. They therefore abandoned them after six or eight months, but still they refused to pay what was due. They allowed us to alter the rate of charge for the rent, giving us the equivalent of the exchange, but they have always refused to pay arrears.

Mr. MAUDE: Have you taken any legal steps in the matter?

The CHAIRMAN: If you saw the last communication that we made, perhaps you would not think it quite wise to enter now into the details of this question. It may be, as I have said, that some of the shareholders may be asked to co-operate with us, and we may have to appeal to the public press in order that the Government of Bahia may see that English capitalists will not fail to establish their claims for want of the means to enforce them. A letter has been sent to the Government, signed by myself as chairman of the board, and any shareholder can come to the office and see it. If Her Majesty's Foreign Secretary can be got to interfere in the matter, I think the rights of the shareholders will be sure to be enforced.

Mr. MAUDE said he did not think that much dependence could be placed upon the law courts of the country.

The CHAIRMAN said he hoped that Lord Derby would give such aid in the matter as to supersede the necessity of any appeal to the courts.

Mr. KING said that the explanation given by the chairman was so far satisfactory that it would probably reconcile the shareholders to a suspension of dividends. He hoped that it would be no more than a suspension. The increased cost of coals, amounting to £3000, was sufficient to account not only for a 3 per cent. but a 6 per cent. dividend upon the ordinary capital. He did not, therefore, think that there would be any expression of disappointment on the part of the shareholders at a result which, though it might be unpalatable, could take none of them by surprise. With regard to the sum of £1200 which was put to plant, but which the chairman explained would be subject to subsequent adjustment, it appeared difficult to resist the notion that the method that had been adopted had been simply resorted to to meet the exigency of the account.

The CHAIRMAN said it had not been done to meet the exigency of the account. If it had been possible to separate what belonged to capital and what to revenue, it would have been done; but the work was now in progress, and they had no means of knowing how much ought to be placed to capital, and how much to revenue. The amount, however, to be placed to revenue was but a very small part of the £1214, so that practically it would not have affected the balance-sheet.

Mr. KING said he understood the directors to postpone their claim to the £400 for fees, to which they were legally entitled. If that were the case, they ought to be entered as creditors for the amount.

Mr. STEPHENSON said that the fees were absolutely given up by the directors.

The CHAIRMAN said the claim would be a moral and not a legal one.

Mr. KING said he should be glad to receive some explanation as to the large amount due from the Bahia Government. The chairman had only explained one item of £500.

The CHAIRMAN said that under the circumstances it was hardly desirable to enter further into questions of detail. Every shareholder could see the communication that had been forwarded to the Government on the subject.

Mr. KING inquired if the arbitrator last year took all questions into consideration.

The CHAIRMAN said that the arbitrator was appointed only to decide one question.

Mr. KING said he could speak from personal experience as to the qualities of the new manager appointed by the company. He was probably in a position to know more of the abilities of Mr. Muriel than any other shareholder present, he having been for three or four years engineer and manager to a company at Smyrna, with which he (Mr. King) was connected. He left Smyrna with the sincere regret of the board, who were highly impressed with his efficiency and intelligence. He augured well for the future of the Bahia Company now that its concerns were placed in such able hands; and he congratulated his brother shareholders upon the appointment that had been made.

Mr. AIRD said he was glad to hear so good an opinion expressed of Mr. Muriel, and he hoped that at last they had found the right man in the right place. Hitherto, the company had been most unfortunate in their managers. It was scarcely right, however, for the shareholders to look too much to the engineers, and to blame them for all that had occurred, because directors had been appointed for the express purpose of keeping things in order and promoting the prosperity of the company. He confessed that he heard with a considerable feeling of disappointment, differing in that respect from some gentlemen who had previously spoken, the statements made with reference to the present position of the company. He could not bring his mind to think that, if the organization and arrangements of the company were as they should be, its position would not be very different from that which it at present occupied. Seven or eight years ago, when the present chairman was appointed, the utmost confidence was expressed in his ability to correct the defects which had unfortunately crept into the management of the company from the commencement. He desired to submit to the board that much more energetic steps must be taken if the unfortunate shareholders of the company were to have anything like the dividend which they originally expected, and which he thought they might still receive if existing difficulties were met in a decided spirit. Defects might not be found out during the first year or two, but when things went on badly from year to year, it would only be natural to conclude that there was something radically wrong in connexion with the works themselves, and he could not bring his mind to think that the directors had faced that matter as boldly as they should have done. The course which had been adopted was prejudicial in many ways. When a new manager went out he found that the works were such as would do credit neither to himself nor to the company, and a feeling of disappointment naturally came over him. He tried to do the best he could, but he did badly and was discouraged. The result was the directors were dissatisfied, and the manager either resigned or was dismissed. He thought that many of the difficulties that had arisen between the company and the Government might be traced to the same unfortunate difficulties; if the works were not as they should be, the supply of gas might be insufficient. If difficulties were cropping up at every point, it was reasonable to suppose that the Government would not look with much favour upon a company whose affairs were conducted in that manner. He did not wish to say anything to injure the feelings of any gentleman present. He thought the company was fortunate in having such an efficient board, who were so well able to take care of their interests. He had the most perfect confidence in them, but he thought they had committed an error of judgment in regard to the manner in which the affairs of the company had been dealt with. The way to get out of the difficulty was not to attempt to do little things, but to look the difficulties boldly in the face—to put the whole matter plainly before the shareholders, and to appeal to them with confidence in regard to anything that might be necessary to be done.

Mr. MAUDE said he observed that in the accounts there was a charge for turbs, and inquired whether that kind of fuel was again being tried.

The CHAIRMAN said it was being tried, not merely in the laboratory, but in the retort-house, and the manager found that if he could get it dry he could make good use of it. He was glad to hear all that had been said in favour of Mr. Muriel, and believed that he would eventually bring the company into a sound condition. It did not rest with the directors so much as with the engineers and manager on the spot; more depended upon the engineer than upon all the directors of the company. Hitherto the directors had never been able to get an engineer in whom they could place perfect confidence. Mr. Muriel combined two qualities that they had never before had in combination—ability and sobriety. He had been greatly disappointed from time to time with the engineers who had been sent out. He was sorry if he had disappointed any of Mr. Aird's expectations in regard to his own appointment as chairman of the company. He had, however, been more disappointed than any one else with the results of his own efforts. The failure had not arisen from any want of attention on his part to the interests of the company; he had devoted himself to them day and night; indeed, when the time of re-election came, it was his intention to resign, since the affairs of this and other companies were pressing too heavily upon him.

The motion for the adoption of the report was then put and carried.

It was then resolved, on the motion of the CHAIRMAN, seconded by Mr. STEPHENSON, that a dividend at the rate of 10 per cent. per annum for the half year on the 10 per cent. preference capital, and at the rate of 7½ per cent. per annum on the 7½ per cent. preference capital, less income-tax, be declared.

The CHAIRMAN said the next business was the re-election of directors. The first gentleman who retired by rotation, and offered himself for re-election, was Mr. Joseph Quick. This gentleman had not been able to pay much attention to the affairs of the company, having been abroad for some time; but in future his time would be more at his own command, and he had promised to give more attention to the company's affairs.

Mr. Quick was unanimously re-elected.

The CHAIRMAN said that, with regard to himself, he could not consent to be re-elected. His health had lately suffered, and he could no longer undertake the responsibility of conducting the affairs of the company.

Mr. AIRD hoped that the chairman would reconsider his decision, as it would be a misfortune to the company to lose his valuable services, especially in the

present critical position of affairs. The shareholders had perfect confidence in the chairman's abilities, and would very much regret his retirement.

The CHAIRMAN said he had already intimated to the members of the board that he had quite made up his mind upon the subject, in consequence of the state of his health.

Mr. STEPHENSON appealed to the chairman not to resign until some arrangement could be made for appointing a successor.

Mr. AIRD again expressed a hope that the chairman would, under the circumstances, reconsider his decision.

The CHAIRMAN said he had no objection to be re-elected a director, but he could not take the office of chairman. He would remain at the board until some satisfactory arrangement could be made for some one to take his place.

The chairman was then unanimously re-elected a member of the board.

Mr. MAGNUS OHREN was then re-elected auditor of the company.

Mr. ERASMUS WILSON moved a vote of thanks to the chairman, who, he said, was entitled to the gratitude of shareholders for consenting to occupy his position in the present state of the company's affairs. He was glad to think, from speeches he had heard, that when vacancies legitimately occurred in the board, there would be no difficulty in filling them up from amongst themselves. With regard to the speech of Mr. Aird, he thought that gentleman had not sufficiently taken into consideration the difficulties arising from the want of payment on the part of the Bahia Government. This had been partly caused by the miserable war that had existed for some time in the Brazils, and which has interfered with the honourable conduct of the financial business of that government. Now that they were recovering in some measure from their difficulties, it was to be hoped that the amount due to the company would be forthcoming. It was probably merely from want of money that they had not been able to pay attention to the claims of the company. With regard to the chairman's ultimate retirement, he was quite sure that it would be a source of satisfaction to the directors to remember that they had sat under the chairmanship of Cornelius Nicholson.

The motion having been unanimously adopted, the chairman briefly acknowledged the compliment, and the proceedings terminated.

METROPOLIS GAS SUPPLY.

METROPOLITAN BOARD OF WORKS.—At the meeting of the board on Friday last, a letter was read from the Imperial Gas Company, stating that they have received a letter from the Board of Trade, in which, after alluding to the prospect of an eventual purchase by this board of the metropolitan gas undertakings, they recommend the company to co-operate with this board in such steps as may be calculated to promote a friendly solution of any dispute existing between them and the company; and stating that whilst they are not seeking to sell their undertakings, they are quite prepared (if Parliament should hold a transfer to this board to be desirable) to entertain any reasonable proposal for the purpose based on fair and equitable terms such as have been sanctioned in similar cases. On the motion of Mr. Richardson, the communication was referred to the Works and General Purposes Committee, with power to act.

Dr. Stevenson's report on the gas supplied by the Imperial Company to the vestry of St. Pancras, during the month of November:—Maximum light, estimated by sperm candles, according to the Act—16·0. Minimum light, sperm candles—13·9. Average light, sperm candles—14·5. Traces of ammonia, indicated by turmeric test-paper—traces on each occasion. Traces of sulphuretted hydrogen, indicated by lead test-paper—none on any occasion.

MARGATE GAS SUPPLY.

PROPOSED GAS CONSUMERS COMPANY.

A Meeting of Ratepayers and Gas Consumers, convened on requisition by the Mayor, was held in the Town-Hall, Margate, on Wednesday, Nov. 18, for the purpose of considering the best means of supplying the town and neighbourhood of Margate with good and cheap gas, and also to enable the engineer of the proposed Gas Consumers Company, on behalf of the promoters, to attend and explain the objects of the proposed company. The MAYOR presided.

Mr. WOODCOCK, surveyor to the proposed new company, said that, being engaged in the neighbourhood constructing gas-works for Westgate, he had been asked to turn his attention to Margate. Having communicated with some of the inhabitants, he brought down Mr. G. W. Stevenson, engineer, and Mr. Cruse, parliamentary agent, to make inquiries. They together visited various spots of land for the erection of new works; and, there being some difficulty as to whether they could obtain the site fixed upon, the mayor had offered them a piece of freehold land for the purpose. They then proceeded to make all the necessary arrangements, and Mr. Cruse was present, with a copy of the bill they intended to lay before Parliament. Mr. Stevenson would have been present, as announced, but he was engaged at that moment with the Metropolitan Board of Works, in the arrangement on their behalf for taking over the whole of the gas-works of London on the precise conditions and terms on which the proposed company for Margate now offered the inhabitants to take over the gas-works of this town. It was simply this, that they should obtain an Act of Parliament to authorize them to construct works, and to obtain the existing works from the existing company; and, having done so, they were empowered to offer the same to the town, and the promoters of the bill asked for powers to enable the town to raise funds to purchase these works, and make them so that the inhabitants would become the proprietors of their own gas-works. Under that Act of Parliament the inhabitants would not only have the advantage of a reduced rate for the charge of gas per 1000 feet, but even those who did not consume gas would be in a position to receive a portion of the profits, for the promoters provided that the profits, after payment of due interest on the capital sunk for the works, should be appropriated in liquidation of certain taxes—in diminution of the general district rate leviable by the corporation of the town. It was intended, therefore, by this Act to place in the hands of the inhabitants the entire control of the gas consumed, and to appropriate to themselves that profit which now went into private pockets.

Mr. CRUSE read the clauses of the bill which the new company intended to apply for. He observed in passing that it was a very singular thing for two towns to have only one gas company. He, however, would not say anything against the present company. They had done a very good thing for years, and he would not now attack them. The Gas Consumers Company intended to supply Margate only, and not Ramsgate. In reference to the acquisition of the present gas-works, he observed that the promoters of the new company might have applied for compulsory powers to obtain them or gone to arbitration, but they wanted to purchase the works by agreement and not by force. At the present there were no powers given to the corporation to purchase the gas-works, but the promoters intended to apply for such powers in their bill. With respect to Mr. Devayne's land at Shallows, they had put compulsory acquisition in the bill, but they did not exactly mean that, only as the owner was away they were bound to put it in the bill so. It was provided that the corporation had the option of purchasing the works, and the company must sell the gas-works if the corporation desired. And if the provisions were not stringent enough on this point, he was willing to make them more so to secure the object in view. It was provided that when the works belong to the corporation that body should employ the income received therefrom—first, in the payment of expenses; secondly, in payment of the interest on money borrowed; thirdly, in repayment of any principal sum borrowed; and, lastly, in diminution of the general district rate levied by the corporation, so that the money laid out would go into their own pockets again.

Mr. FELLS inquired whether Mr. Cruse could give them any information as to the cost of the manufacture of gas.

Mr. CRUSE replied that he could not, as that was Mr. Stevenson's department.

Mr. HOBBS, of Ramsgate, however, volunteered to give some information on this point, and stated that, at a meeting at Ramsgate the previous evening, it was resolved that a letter be written to the directors of the Isle of Thanet Gas Company, asking whether they would be willing to sell the works to the local authorities, and upon what terms and conditions.

The MAYOR asked Mr. Hobbs whether the local authorities had power to purchase.

Mr. HOBBS said he thought they had.

The MAYOR thought they had not.

Mr. HOBBS said he believed there were some 640 towns that had no Act whatever in connexion with the gas-works, and he did not think an Act would be wanted here. They asked the deputy whether they could break up the road, and he said they could.

The MAYOR said this was an error, as they could not.

Mr. HOBBS contended that there as on they were paying 5s. for gas in Margate was because they had not got the works in their own hands, and his opinion was that the water and gas ought to be both in the hands of the town. If the gas could be made at 1s. 4½d., as had been stated to him by a person at Ramsgate, they would not have to pay an atom of rates. In the Isle of Thanet Gas Act there was a clause that if the company could not supply gas at as cheap a rate as they could light the streets with oil, then the Act was null and void. It could be proved that the streets might be lighted cheaper and more brilliantly at about half the price, and therefore he contended that the Act was null and void, and that the inhabitants could do just as they liked. The shares of the Isle of Thanet Gas Company had risen from £20 to £60, and the shareholders got their 15 per cent. Having mentioned that at Hanwell the cost of making gas was only 2s. 4½d., he was asked whether that included every expense or merely the cost of manufacture, and he said it included every particular. At Walsall they were clearing £2000 per year after expenses, and at Manchester £80,000.

Mr. JAMES DENTRY proposed—"That this meeting is of opinion that the present supply of gas is unsatisfactory and too high in price, and that it is expedient that a gas consumers company be formed to obtain a proper and satisfactory supply."

Mr. PERRY seconded the motion.

Mr. KEBLE observed that the consumption of gas entered so largely into their comfort and convenience that it was necessary they should obtain it as cheap and pure as possible. He thought, however, that it was very bad policy to abuse a man if they wanted to jump into his shoes; but he thought it was exceedingly good policy to help the corporation to bring the price of gas within the means of every one, and to make it both much cheaper and much purer than it was at the present time. He had been a gas consumer for many years, and he did not complain of the price of the gas or the purity of that formerly supplied, but he fancied within the last year or two the gas was not quite so good as it used to be. Well, now, what was the remedy offered them that night? The remedy offered was to establish a new company, by which they were told they should get better gas and much cheaper. But let them look at the question for one moment. A new company was formed, say, and they offered to supply the gas at 3s. or 3s. 6d. per 1000. As a matter of course the new company was not going to turn the old company out at a bound, because the old one would come down in its prices. They might say by this that the inhabitants were benefited. He, however, did not believe they would, because the end of it would be that the two companies would amalgamate. The worthy mayor thought so some years ago, for he said it was most undesirable to have two companies; but at that time he entirely agreed with him (Mr. Keble) that the vendors of the gas should be the representative body of this town. He (Mr. Keble) had not altered his opinion, because he considered it was the most rational course for the town to take. The corporation themselves did not want the profits of the directors of a gas company, and as a matter of course they could go to the reduction of rates. There was no question about it, and he should strongly advocate the town acquiring the gas-works. He was not, however, at all in favour of the resolution proposed, for it pledged the meeting to start a new company. Let them do something that was more practicable. He was glad that a meeting had been called, and that the gas question had been ventilated, as it would have the effect, at all events, of not only reducing the price but increasing the purity of the gas. The resolution said that it was expedient to form a gas consumers association for obtaining a proper and satisfactory supply of gas. But he doubted very much whether that would attain the object they had in view. They might have it for a short time, but it would not be permanent. Two companies could not exist in so small a town as Margate, and this being the case, every practical man would say that the result would be that one company would buy the other up, and the consumer would have to pay the interest of the extra capital so invested. Therefore he thought if the council could possibly come to a just and equitable arrangement with the gas company, it would be the best thing to do, and he deprecated vested interests standing in the way of public improvements. He was sure if the gas company were transferred to the corporation we should have permanently a gas not only cheaper but purer, and a large profit to hand over to the ratepayer. That was his conviction, and he should be pleased to move an amendment to the effect—"That this meeting is of opinion that the corporation should possess the gas-works, and that they should be asked to enter into an arrangement with the gas company as soon as possible." They might then go a little further, and if the gas company turned a deaf ear to a respectful request from the council stating that they were determined to have a better and cheaper supply of gas, he thought the mayor would be justified in calling the inhabitants together to see if they could not by legal means force the gas company to sell their property at an equitable price. He, however, did not think the company could possibly have any objection to a just arrangement, and their works falling into the hands of the corporation.

The MAYOR said he believed the corporation had no power to purchase the works; and, if they had, see what thousands of pounds of expense they got into at Ryde, and almost ruined the place by attempting to do so. There was only one way—to go into a gas consumers company, and then it would be for the burgesses themselves to appoint their own chairman and directors out of their representatives at the council, to carry out their wishes.

Mr. KEBLE quoted from a local paper published a few years ago, that the mayor was then opposed to the notion of having a second company in the town. He concluded his remarks by proposing as an amendment—"That the meeting believes that the gas-works should be in the hands of the corporation, and that means be taken to secure that end as soon as possible."

Mr. SEAR said it did not appear to him what was the real issue before the meeting. The true argument urged appeared to be that the manufacture of the gas should be in the hands of the corporation, and that the surplus profits should go in reduction of the town rates. That seemed to be the great argument—that the town should benefit instead of private individuals. But if the resolution of Mr. Dentry was passed, it seemed that the project was to form a gas consumers company. If the object was to put it in the hands of the corporation, the bill ought to give powers to the Corporation of Margate to purchase the plant.

The MAYOR: Mr. Cruse tells you it is so.

Mr. CRUSE: The clause is: "And that provision be made for the purchase of the undertaking by the Mayor and Corporation of Margate."

Mr. SEAR: But this resolution is to form a gas consumers company, and that is quite a different thing.

The Mayor: The object is rather to get it into the hands of the corporation through this medium.

Mr. Sear said it really seemed to him that if they felt the town ought to have the manufacture of gas and the profits ought to go towards the alleviation of the rates, to form a gas consumers company was to go to an unnecessary means to gain the end. If they were going to put the manufacture of the gas into the hands of the corporation, it would be different from putting it into the hands of a company.

The Mayor here pointed out that Mr. Sear was in error, and handed him the clause of the bill to read.

Mr. Sear read the clause in question as follows: "And if at any time after the completion of the company the corporation shall desire to purchase the same, and shall give six months notice," &c. Mr. Sear remarked that, according to this it would seem that this company was to buy up the old company and the corporation was to buy the two companies.

The Mayor: The corporation has no power to purchase the old gas-works.

A Burgess: Why do not they get it then?

The Mayor: Because they cannot, and this is the only medium through which to get it. According to this bill you can take them or not, as you please.

Mr. Sear observed that seven years ago a feeling was abroad in the town that the ratepayers ought to have the manufacture of the gas for their own profit, and the mayor was then of the same opinion. He (Mr. Sear) quite agreed that they should take the manufacture of gas into their own hands, but he thought the meeting would not be willing to pay for the construction of the two companies running side by side and doing damage to each other. Some months ago a deputation waited upon the gas company for another purpose, and then ventured to make inquiries as to the purchase of the present works at the rate of 10 per cent. in perpetuity. The company, however, said they could not look at that. The thing therefore fell through, but he hoped that wiser councils would now prevail. He should second Mr. Keble's amendment, because it was bad policy to fly in the face of a gas company. Be it remembered the gas company had great difficulty in getting £17 per share at one time, and they were then not so sure of realizing a good dividend. Now they were more successful, and the ratepayers seemed to think as the apples were grown they ought to run in and pick the fruit. He did not quite see that, but he thought the corporation ought to approach the gas company and ask them in the first place to give us a reduction in the price of gas and to sell us the works at a price if we wished to purchase.

Mr. Ryan: There was an offer made to the water-works company, some time ago, to purchase their undertaking on behalf of the town, and, if you have power to purchase that, why have you not power to purchase the gas company?

Mr. Dentry, as the mover of the resolution, said he was quite of Mr. Keble's view, that the corporation should manage the manufacture of gas, and that there should be no two companies, and also that the present company should be paid liberally for risking their money. But he thought the step they were taking would eventually lead to that. The present company had been approached already, and approaching them now with the idea of purchasing would be a loss of time. He should not have proposed the resolution had he not thought that the bill provided for the purchase of the works by the corporation when they were intelligent enough to do so. Mr. Keble had said that the two companies would probably amalgamate, and then the town would reap no benefit; but he did not think they would cut their own throats like that. All that he wanted was the price of gas reduced, and he doubted very much whether it was of any use going to the present gas company and asking them to do it. He wished for the new company to buy up the old one, and then for it to pass into the hands of the corporation.

Mr. Cruse pointed out that by the 35th clause the proposed bill provided for powers to be obtained to purchase the undertaking of the Isle of Thanet Gas Company, and that was the first thing they were going to do.

Mr. Parry put it to the meeting when they were likely to get the best terms, when they had one company or two.

The amendment was then put and negatived, and the original motion carried.

Alderman Knight proposed the next resolution—"That this meeting recommends that a gas consumers company be formed in order to obtain parliamentary powers for supplying pure gas of 14 sperm candle illuminating power, of sufficient quantity, and at a price not exceeding 4s. 6d. per 1000 cubic feet." In doing so he remarked that the expectation had been held out of the inhabitants getting gas at 3s., but he would not have moved a resolution with that figure in it, because he knew they could never get gas at that price, and they were only doing their cause harm by making extravagant assertions. He believed it would be a good thing for them to get a new company. In the first place, the town was paying at least £100 a year more than they ought to pay for the public lamps, which was a halfpenny rate to begin with. Something had been said about the cost of gas elsewhere, and they ought to be charged much less in Margate than they were at the present time. He did not think it was fair, however, to take Manchester, London, and all the large towns in the country. He took Malvern, something of the size of Margate, where they consumed nearly 15 million cubic feet of gas in the year, and the local board were in possession of the works. The consumption of coals was 1568 tons, and here again he must ask those present to correct an error. The cost of coals at Malvern was £1394, and the total cost of making the gas £2539. So that coal was not a small item in the manufacture, as had been represented. He would not be committed to a false assertion. At Malvern they could make gas at 2s. 10d. per 1000 cubic feet, and they could pay £500 a year on borrowed capital. Therefore he must say there was sufficient to prove that in Margate they were paying too much for gas, without any exaggeration at all. Then, again, he took another small town—Abergavenny—where they consumed a considerable quantity of gas, and there they could make gas at 2s. 4d. per 1000 cubic feet. Therefore he said it was not fair to delude the people, and say it could be supplied at 2s. 4d. If they could get a gas consumers company to supply them at 4s. 6d. they would be doing something, for that was putting it at the outside price they could charge. It was no use to be led away with the idea that they were going to have gas—and he did not think Mr. Cruse said so—at 3s. per 1000. The present gas is bad to begin with. It was not of sufficient illuminating power, and the consumers were at present paying 5s. per 1000, when they ought to have it for 4s. They ought also to have it in their power to remove the gas-works from the town.

Mr. Isaacson and Mr. Sear pointed out that a Provisional Order would secure to the corporation the power they required to purchase the present gas company.

Mr. Pointon observed that there was very little difference between 4s. 6d. and 5s., but he would second the resolution in order to get the matter before the meeting. He thought it had been clearly shown that the gas company were charging too much, and as they would not meet the town he thought the only way of meeting the question was by supporting a new company. They would thus succeed in lowering the price of gas if they did nothing else.

The Mayor said that if this bill cost £500 to obtain, the interest on the outlay would be £25 a year. Suppose they never carried out the bill, if they could not drive £25 a year reduction out of the present company he was a Dutchman. Let the corporation hold it to the gas company, and then see whether they would not light the lamps with purer gas; and let the Gas Consumers Company hold this bill out to the present company and see if they did not reduce the price of gas. The driving power was worth all the money.

Mr. Dentry held that coal did not form more than one-tenth of the expense in the manufacture of gas. He had been told so, and he had read so as well, and besides that the company had the coke to sell. There was also a great deal to sell besides the coke, and all this would reduce the price of their coals from 30s. to 17s. a ton. Coal, therefore, formed a small item. The great thing was the expensive plant.

Mr. Hobbs: The price of coal at Walsall is 16s. and 17s. a ton.

A Voice: Just about half the price of our coals.

The resolution was eventually put to the vote, but, as the local paper remarks, the idea of 4s. 6d. per 1000 feet seemed to cast a sudden damper over the hitherto enthusiastic meeting, and, although the motion was carried, only a very few hands were held up in its favour.

Votes of thanks were duly passed to Mr. Hobbs, the promoters of the new company, and the mayor for presiding.

Mr. Cruse called the attention of the meeting to a memorial he had drawn up for signature, to the following effect:—"We, the undersigned, undertake to consume the gas of this (the Gas Consumers) company at a price not exceeding 4s. 6d. per 1000 cubic feet." Mr. Cruse said this would strengthen their hands considerably, and passed it round for signature. It certainly did pass round, for very few signed it at the meeting.

As the meeting was breaking up,

The Mayor stated that the second object for his coming to the conclusion to stand as mayor again this year was that he might promote this company. He promised he would tell them in about a fortnight.

The meeting then terminated.

THE DISAPPEARANCE OF ORGANIC MATTER IN WATER RUNNING THROUGH IRON PIPES.

By A. Wynter Blyth, M.R.C.S., A.K.C., &c.
Analyst to the County of Devon, Medical Officer of Health, &c.

The continuous oxidation of nitrogenous substances in ordinary running water freely exposed to air has been long known; but that organic matter disappears, and that water becomes purer, by simply running a certain distance in closed pipes, is, I believe, a fact not generally known, and of considerable importance to the sanitary engineer and hygienist.

Both the supplies given in the table are intermittent, and therefore it is possible that in places the pipes may be rusty, although I am assured that the glazed iron pipes used for water-mains do not rust; but, if they do, the purification would be easily explained. The samples, both of the Barnstaple and Ilfracombe supply, were taken in the same day. At Barnstaple, first, R was carefully collected; we then walked slowly down to A, half a mile from R; from thence to B, half a mile from A; and from thence to C, half a mile from B. The last sample, C, shows a difference in total ammonia of 0·08 m.grm.; the nitrates are certainly not increased, rather the reverse. The Ilfracombe supply was sent to me by the urban sanitary authority, and was collected with great care in the same day. There is a remarkable difference between the same water before and after its courses through the iron mains.

	Solid Residue.			Ammonia, Free.	Ammonia, Albuminoid.	Nitrogen, as Nitrates, &c.	Chlorine.
	Organic & Volatile.	Fixed.	Total.				
	Milligrms. per Litre.	Milligrms. per Litre.	Milligrms. per Litre.	Milligrms. per Litre.	Milligrms. per Litre.	Milligrms. per Litre.	Milligrms. per Litre.
Barnstaple supply—							
R, res'voir after passing thro' the filter-beds	40·0	60·0	100·0	·060	·090	2·39	16·14
A	40·0	60·0	100·0	·040	·080	2·00	16·14
B	40·0	60·0	100·0	·035	·075	2·00	16·14
C	39·0	60·0	99·0	·010	·000	2·05	16·14
Ilfracombe supply—							
A, taken directly after passing the filter-beds	70·0	140·0	210·0	·060	·140	Not estimatd.	21·43
B	10·0	140·0	150·0	·020	·060	„	21·43

Barnstaple, Oct. 22, 1874. —*Chemical News.*

Explosion of Gas at Bradford.—On Tuesday morning, Nov. 24, there was an explosion of gas in an empty house, 313, Wakefield Road, Bradford, owned by Mr. W. Watkins, plane maker, &c., Westgate. The tenant left the house on Saturday, and it is supposed must have neglected to turn off the gas. At nine o'clock on Tuesday morning a lad went into the house with a lighted candle, when an explosion ensued, and the whole of the windows, upstairs and down, were blown out, and the ceiling damaged. Happily the youth escaped without any injury whatever.

Another Bubble Company in Paris.—Emile Gantier, a Belgian by birth, was brought up for trial on the 17th ult., before the Paris Chamber of Corrections' Police, charged with fraud and with violating the law on public companies. In 1860, in conjunction with M. Lenoir, a chemist, and several other persons, he formed a society for developing a motive force, consisting in the expansion of air and the combustion of gas by means of electricity. In 1863 the society was converted into a company, with a capital of 1,000,000f., in 2000 shares of 500f. each; but it was wound up five years later, with a deficit of 480,000f. It was reconstituted under the name of the "Société des Moteurs Lenoir et des Usines à Gaz Réunies," and devoted itself to the erection and purchase of gas-works. Eight thousand debentures were created and placed at Gautier's disposal as manager, to be issued when he thought proper. By misrepresentations as to their value, he induced the public to accept them, and in 1869, without consulting the society, he issued 8000 others, which were signed by a board which sanctioned everything he did. At the general meeting of 1870 he made no allusion to this second issue, but gave a flattering account of the society's progress, and obtained authority to issue 32,000 debentures, and likewise 12,000 additional shares. The latter, however, were not readily taken up. He thereupon established, in the name of his brother-in-law, a Comptoir National des Fonds Publics for the purpose of floating them, as also a financial paper, entitled, with covert irony, *Probité Financière*. In 1871, by presenting a fictitious list of shareholders, who were represented as having paid up a quarter of their subscriptions, he induced the Bourse to quote 12,000 shares and 32,000 debentures, and by puffing the concern in various papers, at a very large expenditure, he issued a portion of the new shares. Sufficient capital not being, however, thus raised, he procured loans from London and Brussels bankers; but the debentures fell on the Bourse, and in 1874 the company was refused a contract to supply Bordeaux with gas on the ground of the instability of its position. It was discovered, moreover, that Gautier had wilfully mixed up the numbers of the bonds recognized by the Bourse with those which had not been allowed a quotation. On his arrest it was found that he had issued 50,000 obligations, at an average of 165f. each, and that 9,000,000f. had altogether been raised. The liabilities amounted to 11,393,000f.; and the assets, including the sums not paid up on the shares to nearly 8,000,000f., The shareholders will receive nothing, and the debenture-holders and other creditors will barely obtain 65 per cent. These are the allegations against Gautier and eight other persons, including the Marquis de Messey, chairman of the board; and the four directors, who are included in the charge. The trial will probably occupy a week.

IRON AND COAL TRADES OF SHEFFIELD, SOUTH YORKSHIRE, AND NORTH DERBYSHIRE.

(FROM OUR OWN CORRESPONDENT.)

In the iron trade of this town and vicinity the last portion of the year appears to be passing over without producing any very great changes, either in respect of the general amount of business doing or in prices. It cannot truly be said that the local iron trade is greatly depressed, but it may with all accuracy be described as being quiet in almost every direction, and that, too, with no very pronounced prospects of early improvement. Some few firms are able to find their workmen a sufficiency of employment in working out contracts and orders placed several months back; but these are exceptions, and serve rather to render the general dulness more apparent than otherwise.

Several of the foundry establishments—notably Staveley, Thorncliffe, Clay Cross, and a few others—are pretty well employed; and even if they are not over-pressed with favours, they have those on hand which will serve to occupy most of the winter months in executing. Prices of foundry productions, it may be said, have a clearly downward tendency.

The coal trade is quite up to the average—indeed, in the house coal branch much pressure exists. There is also a very good business in locomotive and ordinary steam coal for home use, to say nothing of the steady export demand. Many of the collieries hardly find themselves able to get all their production carried away by the railway companies. Prices are, at present, nominally unchanged.

IRON AND COAL TRADES OF SOUTH STAFFORDSHIRE AND EAST WORCESTERSHIRE.

(FROM OUR OWN CORRESPONDENT.)

At the usual weekly meeting of the ironmasters of this district, held at Birmingham on Thursday last, the inquiries for finished iron were more numerous than lately reported, though business was very much restricted by the want of confidence in the market, which is now shared by all classes of buyers. The makers of second qualities of iron were anxious to do business, and unmarked bars are now easily procurable as low as £9 per ton, and sheets (singles) at £12; indeed, for all classes of unbranded iron competition is daily growing more severe, and prices are consequently weak. The depression in the northern districts is now seriously affecting local producers, the quotations by northern firms, for delivery into this district, being such as would leave little margin of profit on South Staffordshire iron.

For better qualities, however, of well-known brands, the demand is still fairly well sustained. The mills and forges devoted to this class of produce are in steady operation, and the standard of £10 10s. to £11 for bars is maintained.

The local hardware trades are generally active, and cast-iron goods are in brisk demand. The reduction of 20s. per ton on heavy castings reported a few weeks ago, together with the firmness in the pig iron market, has had a marked influence on the engineering ironfoundry trades, and the leading establishments are well employed.

The demand for pig iron is buoyant, the local production still being considerably below current requirements. The number of furnaces at present in action is yet below the number "blowing" this time last year. Prices are steady at £5 to £5 5s. per ton for hot-blast native all-mine, and £3 5s. for cinder pig.

The coal market has somewhat improved. For household descriptions there is now a brisk inquiry, but fuel for manufacturing purposes is plentiful, and prices are maintained with difficulty. Good forge coal may be had at 9s. per ton, and engine slack is in abundant supply at prices in favour of the buyer. The colliers are now working more steadily than they have done for some time past, and there is no prospect of a scarcity of fuel this winter.

In the Cannock Chase district moderate activity prevails, but the output will be considerably augmented shortly, as there are several new colliery plants rapidly approaching completion.

Coke is in somewhat improved request, and prices remain unchanged.

THE COAL AND IRON TRADES OF LANCASHIRE.

(FROM OUR OWN CORRESPONDENT.)

Although the extra demand caused by the West Lancashire strike has now been withdrawn from the Manchester market, and prices have receded to those which were ruling two months ago, the local inquiry is still exceedingly brisk for all classes of coal, and the full list rates are readily obtainable. The severe weather has naturally maintained an active demand for house pit coal; good furnace coal is scarce, and there is a good demand for both engine fuel and slack, but in these two last the same activity does not appear to prevail in all quarters which characterizes the better classes of coal.

For coal for gas-making purposes there are still a number of good inquiries in the market, and in some cases sellers seem inclined to demand more money; but, now that the usual supplies are obtainable from the Wigan district, the Manchester market may experience a little ease. The shipping trade for this description of coal is a little brisker.

The Liverpool market is at present rather unsteady, in consequence of the larger supplies coming in, and prices, though not lower than they were before the strike, are irregular. In the shipping trade there are plenty of inquiries at the October rates, and this appears to be the highest basis on which business can now be done.

In the West Lancashire districts there is a good demand for the present get, as stocks in consumers hands are still low, but prices have returned to their old level, and buyers are looking forward to a substantial reduction as soon as the severe weather has passed. So far as burgy and slack are concerned, it seems doubtful whether present prices can be maintained through the winter, as consumers are pressing very much for a reduction, and, as soon as supplies become more plentiful, the market may probably be easier.

The coke trade is dull, and prices have a downward tendency, the local makers, as I anticipated in my last report, being in some cases compelled to make slight reductions.

No very large amount of actual business has been done in the iron trade during the past week—in fact, the market has been decidedly quiet; but there appears to be some indication that buyers and sellers are getting nearer in their views as to prices, and it is more than possible that a few good orders for forward delivery may be given out during the next few days. The feeling, however, is against selling very largely forward, the stocks of iron being so very low that any material improvement in the finished iron trade of the North would rapidly send up the price of both foundry and forge pig iron. At present, prices are too unsettled to admit of any very reliable quotations.

The local iron-works continue fairly employed, although the rolling-mills are not so pressed as they were. There are, however, some good specifications for plates offering in the market.

THE COAL AND GENERAL TRADE OF THE NORTH OF ENGLAND.

(FROM OUR OWN CORRESPONDENT.)

The long-delayed fleet of light vessels reached the coal ports of the North of England last week, and the shipments of coals of all kinds are likely to be very active during the next ten days. A considerable number of orders for coals of all kinds have been placed in the market, and a large amount of coasting sailing tonnage has been taken up. The prices of household and gas coals have been firm, and there has been a somewhat improved tone in the steam coal trade, though it is far from being in a healthy state. The steam collieries wrought about half time last week, but the gas and household collieries are making eleven days a fortnight.

The iron trade of the North of England has got into a very depressed state. A considerable number of rolling-mills have been laid in, and in South Durham some thousands of men are out of employment. There is likely to be great distress amongst the ironworkers this winter, and as the slackness of business in this trade continues to react upon the manufacturing coal trade, the coke and manufacturing coal-pits feel the depression worse every week. It has been previously reported in this column that the timber trade of the North of England was greatly overstocked.

There were two or three serious failures last week, and great anxiety prevails in this trade. In the early part of the year several merchants believed that the price of timber would advance considerably with the spring, and very heavy stocks of timber were bought in the North of Europe. A very great number of cargoes have been brought across and stored in the Tyne and other ports, without a market. The bills for these are matured, and something very like a crisis has overtaken the trade. There is less demand for cement and fire-clay goods at present, and it may be stated that all classes of materials used by manufacturers for furnaces and other erections are not much inquired after just now. The chemical trade of the North of England remains in the same dull state it has been in for most of the year.

LLANDUDNO SEWERAGE.—It is reported that the Llandudno Commissioners have accepted the plans of Mr. Baldwin Latham, C.E., for an extensive system of sewerage, with a gravitation outfall. The cost will not exceed £20,000, and the outlay will entail an addition of about 10d. in the pound to the rates.

EXPLOSION OF GAS IN NEWCASTLE.—On Wednesday morning the tradesmen carrying on business in the Newcastle Butcher Market were greatly alarmed by hearing a loud report, which was immediately followed by a heavy shock, and on inquiries being made it was ascertained that an explosion of gas had taken place in the poultry alley. It seems that for the past day or two there has been an escape of gas beside a portion of the woodwork used as stalls for toys, boots, hats, and other articles, and in consequence of that a man was sent by the gas company in order to find out the exact place of the escape, and repair it. After taking up some of the flags, it was found that the escape was underneath the stalls, in a part where the occupiers generally store their goods during the night. The man at once set to work to find the gas-meter, and, after opening one of the doors attached to the stall, he foolishly struck a light, and instantaneously a large quantity of gas, which had escaped from a pipe near the meter, exploded with great force, causing a loud report, and shaking almost the whole of the market. The woodwork at each side of the stalls was completely shattered, and a number of the articles stored in the place were more or less destroyed. The man was severely scorched about the face, neck, and hands. After the explosion the gas was found to be escaping from a 1½-inch pipe, which was directly stemmed up.

Register of New Patents.

1072.—JENSEN, P., Chancery Lane, London, "*Improvements in modes of and means for producing and utilizing gas and heat, and apparatus therefor.*" A communication. Patent dated March 27, 1874.

According to this invention one or more coke ovens are so arranged relatively to one or more gas-retorts that the gases and vapours proceeding from the coke ovens heat the gas-retorts, and are then made to commingle with a part of the crude lighting gas from the retorts, and with cold or hot air in suitable and definite proportions for combustion. The heat being then utilized for heating purposes—smelting, boiling, burning, or evaporating—the remainder of the gas in the retorts is purified and used for illuminating or separate heating purposes as usual, or the gases and vapours from the coke ovens may be made to commingle with the whole of the crude lighting gas.

The apparatus is constructed as follows:—The coke oven or ovens are placed under the retort or retorts; the gas and vapours from the fuel in the coke oven pass through apertures in the upper part to a space around the retort, where a suitable and definite quantity of air is admitted for effecting the combustion, the products from which are then led to the chamber, where they commingle with crude lighting gas from the retorts, and with air, in such manner and quantity as to produce the desired heat and economy. The air is by preference first heated by passing through flues or pipes formed in the brickwork, first through the cooler and then through the hotter parts. By means of dampers, facilities may be afforded for sometimes shutting off the gases and products of combustion partly or wholly from the commingling chamber or chambers, and lead them off to a chimney or other place direct. The air-flues may in some cases be formed along the side or sides of a coke oven, and have suitable apertures leading into them, a well-fitting damper or valve in front of the brickwork setting affording the means for controlling the air admission.

When making use of apparatus thus constructed, the coke is not drawn as usual, but consumed in the coke oven. The toil, inconvenience, and loss of heat occasioned by drawing the red-hot contents of the coke ovens, and then quenching them in the usual manner, are in this case avoided. The residual contents of the retorts may be shot or emptied into the coke ovens through a hopper, after the exit passages for the crude lighting gas from the retort have been closed. The fuel with which the coke ovens are charged may consist of coals or other hydrocarbon fuel, alone or in combination with already coked fuel, such as cokes from the retorts, or other cokes.

1079.—NUTTALL, F. D., St. Helens, Lancs, "*Improvements applicable to regenerative and other gas-furnaces.*" Patent dated March 28, 1874.

The object of this invention is to simplify construction, facilitate inspection and cleaning, and enhance durability in flues and parts connected with gas-producing furnaces.

As means therefor the fuel-feeding hopper is provided with a sliding door preferably formed of sheet iron placed in an inclined position, and supported by side-pieces. The flue which leads from the producer to the main flue of brickwork is carried from the producer upwards, then horizontally, and finally downwards into the main flue. In the uptake a damper is placed to shut off the gas from the producer during inspection, cleaning, or repair. In the horizontal end of the flue, above the damper, a door or doors are placed so as to be able to lute the damper, and admit air when required. An opening is provided above the downtake, and a man-hole at the entrance to the main flue. The openings are closed by doors or plates when the furnace is at work.

1157.—BIRCH, R. W. P., Westminster Chambers, London, "*Improvements in apparatus for flushing sewers, drains, reservoirs, and other water-ways, applicable also for discharging measured quantities of water or other fluid.*" Patent dated April 2, 1874.

This apparatus consists of a buoyant dam, by means of which the invert of a sewer, channel, or water-way is stopped, and the water or sewage held back until sufficient is accumulated to float and raise the dam, which then moves from an inclined to a vertical position, and in so doing becomes free to make a partial turn upon pins projecting from its two opposite sides.

1171.—SHORT, T., Glasgow, "*Improvements in apparatus for purifying sewage.*" Patent dated April 4, 1874.

This apparatus is made with an inlet passage communicating through separate sluice-valves with two depositing chambers, in each of which there is a number of baffling plates and gratings which tend to break or arrest the currents, and

thereby favour deposition. Forward of the gratings there is in each chamber a pump placed in a well, into which the water flows through small perforations. The water flowing up, and raised by the pump, passes through quantities of charcoal contained in cages. In the inlet a water-wheel is arranged to be driven by the force of the inflowing sewage, and this water-wheel, by suitable gearing and shafting, drives the pump or pumps and also a screw propeller arranged in the outlet from the apparatus.

1175.—PEARSON, E., Old Kent Road, London, "*Improvements in water-closets and in taps for the same, also applicable to other purposes.*" Patent dated April 4, 1874.
This invention consists in constructing water-closets with a twin pan or basin, making the second pan at the side of the main pan of sufficient size to hold all the working gear of the closet, closing the vertical bottom main outlet-pipe by means of a piston-valve worked by a stem and handle, adjusting a float in such wise to the tap regulating the water supply that the clearance of the side pan causes the float to fall and let in the purging water supply, employing a peculiar tap consisting of the frustrum of a cone adjustable up and down vertically in the hollow cylindrical body of the tap, and placing by preference the waste-pipe in communication with the nearest gully-hole and not with the main drain.

1176.—PEARSON, E., Old Kent Road, "*Improvements in taps, cocks, or valves for adjusting or regulating the flow of liquids and gaseous fluids.*" Patent dated April 4, 1874.
This invention consists in forming a tap with a conical plug, adjustable in the hollow body of the tap by raising it up or lowering it vertically in the same. It is applicable to water, steam, gas, air, or other liquids or fluids.

1189.—PATTISON, J., Naples, "*Improvements in automatic hydraulic apparatus for working pumps and compressing air.*" Patent dated April 4, 1874.
According to this invention hydraulic pumps of common construction are employed to convey water pressure to a distance to an improved apparatus for pumping air or water, fitted with automatic valve gear, and means are described for regulating fluctuations of pressure in pipes.

1200.—FORBES, Rev. G. H., Broughton, Northampton, "*A new or improved method of utilizing the foul lime of gas-works.*" Patent dated April 6, 1874.
This invention relates to improvements upon the invention for which letters patent No. 232, dated Jan. 17, 1874, were granted to the present patentee. According to the present invention, the foul lime of gas-works is subject in the first instance to the process of dry distillation in a retort or other similar receptacle. When the process of distillation has been carried sufficiently far, the external air is admitted into the retort to burn the remaining carbonate of lime.

1207.—PETERS, S., and DONALD, W., Glasgow, "*Improvements in and connected with water-closets, and in part applicable for the supply or discharge of various liquids.*" Patent dated April 7, 1874.
By this invention the usual main discharge-valve of the closet is dispensed with. The discharge passage or pipe is made with two syphon trap bends, one close to the basin, and the second as near as conveniently may be; and, on the bottoms of the bends being filled with water, a quantity of air is imprisoned between them, which causes the water to stand at a higher level in the basin than it would otherwise do. The air space between the bends is connected by a pipe with the top of a closed compartment in the water-supply cistern; and, when the downlet valve in the cistern is lifted by a wire or cord and lever connected to the closet handle, the downrush of water tends to produce a vacuum in the top of the cistern compartment, and in the air space between the two bends in the discharge-pipe down below. In consequence of this action the contents of the basin rush suddenly off by the discharge-pipe. Modifications of the double syphon arrangement may be applied to the water supply-pipe of closets, and are well adapted for the supply or discharge of corrosive liquids. Another part of the invention relates to improved means for obtaining the after-flow required for filling the water-closet basin up to the proper height after the main discharge has stopped, such means being also combined with arrangements limiting the supply of water, which serves for flushing on the closet-handle being drawn up.

1211.—THOMAS, C. W. W., Buckhurst Hill, "*Improvements in apparatus for manufacturing heating and illuminating gas.*" Patent dated April 7, 1874.
This invention of improvements on the patent No. 3416, dated Dec. 16, 1871, consists in supplying the oil to the carburetter automatically by applying to the spindle of the regulating cock of the oil supply-pipe a weighted lever, which will have a tendency to keep the cock closed. This lever is connected by a rod to the gasometer of the apparatus in such manner that, as the gasometer falls, it will raise the weighted end of the lever, at the same time turning the cock and admitting oil to the apparatus.

1215.—RONALD, B., and FARMER, J., Glasgow, "*Improvements in the mode of and apparatus for regulating the supply of water to water-closets and other vessels.*" Patent dated April 8, 1874.
This invention consists of an improved construction of double-chambered cistern with a valve in each and their working levers and connecting mechanism, all as and for measuring a desired quantity of water to water-closets for flushing them, and for other purposes. The cistern is cast in one long narrow form, with a cross division nearer one end than the middle, not reaching the top, so as to form a small chamber at the one end, in which the ball-float of the inlet-valve works (preferably of the ordinary Lambert class) attached to the far end of the large measuring-chamber containing the two gallons or other quantity of water desired to be measured into the basin of the closet or other vessel below. The water admitted at the inlet-valve, when open below as usual, is conducted from that end by a short parallel pipe or rhone, resting by a snug on the end of cistern and the top division plate, over which, as well as the measuring-chamber, it conducts the water into the float-chamber, or otherwise; when the lower part of the inlet-valve box is closed, the water may be so conducted into the float-cistern by a pipe soldered close to it, with open spout. A two-armed lever is fulcrummed near the middle, across and over the division, with pendent rods, each attached by a sliding collar or nut to a slotted weighted valve-lid working into hollow outlet-valve seats, near the bottom of each chamber of the cistern, the one in the float-chamber having a knee coupling fixed to and passing through the division-plate, held vertically also from turning by a flat part on its neck collar and a projection on the side of the plate, and so that the valve works properly on the seat, and, when open, admits the water to the measuring-chamber, while the hollow outlet-valve seat in it passes through the bottom, so that, when open, it lets the water into a small chamber below, from which it flows over the open mouth of the pipe leading down to the basin of the pan-closet.

1223.—HASELTINE, G., Southampton Buildings, London, "*Improvements in water-meters.*" A communication. Provisional protection only obtained. Dated April 8, 1874.
This invention relates to water-meters of that class in which a screw propeller is employed for transmitting the measurement of the water to the indicating dial, and in which the dial-face, the indicating hands, and their operating mechanism, work in water. It consists in the combination in the liquid-meter of a separate gearing frame for connecting the propeller, in a separate winged frame having an enclosed gearing compartment, in a compartment for the connecting and operating gearing formed within the separate frame, in a separate dial gearing frame seated and supported directly upon the separate gearing frame, in an intermatching sleeved sealing joint in combination with the contiguous plates of the dial and gearing frames, in a hard rubber screw propeller, in the combination of a sealing cone on the propeller stem, with a correspondingly formed deflecting shield, in a filter interposed between the contiguous plates of the dial and gearing frames, in combinations with perforations in the plates, and in a metallic mould of peculiar construction.

1243.—LAKE, W. R., Southampton Buildings, London, "*Improvements in water-meters.*" A communication. Provisional protection only obtained. Dated April 10, 1874.
The purpose of this invention is to measure water accurately as it passes through a pipe or faucet. The meter has a circular casing, with circular side pieces screwed on the same. In the casing there is placed a cylinder with four compartments, the cylinder being revolved by swinging buckets attached to it with hinges, so as to cover each compartment.

1256.—SUFFIELD, T., Bermondsey, Surrey, "*Improvements in pumps chiefly intended for acids and other corrosive liquids.*" Patent dated April 11, 1874.
This invention consists in forming the barrel or main chamber of several slabs or strips of glass, slate, or other non-corrosive material held together by strips, bands, or other appliances.

1260.—MOULE, Rev. H., Fordington, Dorset, "*Improvements in the production and manufacture of gas.*" Patent dated April 11, 1874.
This invention relates to a method of producing and manufacturing gas from shale, coal, Boghead, peat, and other gas-yielding substances in combination with chalk or limestone. The proportions employed are four, six, or nine parts of shale or of coal, or of a mixture thereof, with six parts of chalk. The usual methods of heating the retorts and purifying the gas may be employed.

1269.—AUERBACH, G., and GESSERT, T., Elberfeld, Germany, "*Improvements in manufacturing alizarine and isopurpurine out of anthracene.*" Patent dated April 13, 1874.
According to this invention, anthracene is heated with concentrated sulphuric acid to a high temperature; the product is diluted with water, and neutralized by an alkaline carbonate or with caustic alkali. The mixture then contains the neutral sulphates of the alkaline bases employed, and acid sulphates thereof. The neutral sulphates are removed by filtration or crystallization, and the acid sulphates are neutralized by a further addition of carbonate of soda or potash. The product is then heated along with caustic soda or potash as long as a bluish or red colour is produced. From this product a precipitate of alizarine and isopurpurine is obtained on the addition of an acid.

APPLICATIONS FOR LETTERS PATENT.

3928.—RICHARDS, W., Burton Road, Brixton Road, Surrey, "Improvements in instruments for measuring fluids." Nov. 14, 1874.
(This notice is repeated from last No., in which the word "*liquids*" was substituted for "fluids.")
3954.—BACON, J., Gainsborough, Lincoln, and SEARLE, H., Hull, "Improvements in hydraulic pumps." Nov. 17, 1874.
3955.—HALLAM, S., and LAMB, W., Manchester, "Improvements in the fittings for glass water-gauges." Nov. 17, 1874.
3960.—HULME, R., and LUND, E., jun., Salford, "Improvements in pumps." Nov. 17, 1874.
3988.—WALKER, W. T., Highgate, London, "Improvements in the construction of gas-purifiers." Nov. 20, 1874.
3997.—ROBINSON, J., West Bromwich, "Improvements in apparatus for charging gas-retorts." Nov. 21, 1874.
4021.—SCHÜSSLER, C. F., Hamburg, "Improvements in the manufacture of air gas for lighting and heating purposes, and in the apparatus connected therewith." Nov. 23, 1874.

GRANTS OF PROVISIONAL PROTECTION.

3511.—JONES, G. H., Bloomsbury, and WHITE, R. G., West Brompton, London, "An improved method of and apparatus for lighting and extinguishing gas-lamps by galvanic and electro-magnetic influence." Oct. 13, 1874.
3735.—TYLOR, A., Newgate Street, London, "Improvements in water-closets, lavatories, and other apparatus relating to sanitary arrangements and the parts connected therewith; also in the cocks, valves, ball or float valves, hydrants, and apparatus for containing, measuring, controlling, regulating, and arresting the water supply of the same, and for other purposes." Oct. 29, 1874.
3829.—DODGE, J., Eccles, near Manchester, "Improvements in apparatus for exhausting or forcing air and gases." Nov. 6, 1874.
3838.—MARTIN, T., Guildford, "Improvements in lamps and apparatus for lighting the same." Nov. 6, 1874.
3843.—MARCHANT, R. M., Hatton Garden, London, "Improvements in the manufacture of gas." Nov. 7, 1874.
3867.—WRIGHT, F., Westminster, "Improvements in gas-governors." Nov. 10, 1874.
3876.—FORBES, Rev. G. H., Broughton, Northampton, "Improvements in the manufacture of artificial fuel." Nov. 10, 1874.
3882.—PARKMAN, E., Madison Co., Tennessee, U.S.A., "Improved means to be applied to lamps or lanterns to indicate the names of streets or other information, which means will also assist in reflecting the light from such lamps or lanterns." Nov. 11, 1874.
3889.—RAMSAY, H. M., Twickenham, "An improved method of making water-tight joints to stoneware or other pipes." Nov. 11, 1874.
3908.—VALENTIN, W. G., South Kensington, London, "Improvements in the treatment of spent oxide of iron for the purpose of extracting cyanogen compounds therefrom." Nov. 12, 1874.
3910.—MATHER, W., Salford, "Improvements in apparatus for measuring liquids for obtaining motive power, and for exhausting and forcing air and other gases and fluids." A communication. Nov. 12, 1874.

NOTICES TO PROCEED.

2428.—MACKENZIE, T., Wednesbury, "Improvements in steam pumping and blowing machinery." July 10, 1874.
2483.—HENRY, M., Fleet Street, London, "Improvements in the method of and apparatus for treating residua of distillation, fermentation, and similar operations in order to obtain and utilize ammonia, carbonic acid, ammoniacal salts, alkaline carbonates, saltpetre, and other products." A communication. July 16, 1874.
2587.—AITKEN, H., Falkirk, N.B., "Improvements in the manufacture of illuminating gas, and in the apparatus or means employed therefor." July 24, 1874.
3346.—ROBINSON, F., Leytonstone, "An improved mode of and apparatus for the manufacture of gas." Sept. 30, 1874.
3489.—HASELTINE, G., Southampton Buildings, London, "Improvements in apparatus for feeding gas-retorts, and for other analogous purposes." A communication. Oct. 10, 1874.
3717.—CHANDOR, J. A., New York, U.S.A., "Improvements in ignition fuses, and in the means for igniting the same, applicable to lamps, gas-burners, and other like purposes." A communication. Oct. 27, 1874.
3868.—MATTHEWS, H., Bristol, "Improved arrangements and apparatus for removing gases from sewers and effecting the consumption thereof." Nov. 10, 1874.
3908.—VALENTIN, W. G., South Kensington, London, "Improvements in the treatment of spent oxide of iron for the purpose of extracting cyanogen compounds therefrom." Nov. 14, 1874.

3910.—MATHER, W., Salford, "Improvements in apparatus for measuring liquids, for obtaining motive power, and for exhausting and forcing air and other gases and fluids." A communication. Nov. 12, 1874.

PATENTS WHICH HAVE PASSED THE GREAT SEAL.

2060.—PERRETT, E., Westminster, "Improvements in apparatus for filtering liquids." June 13, 1874.
3252.—CHANDLER, S., Southwark, and STEVENSON, G. W., Westminster, "Improvements in apparatus used in the manufacture of gas." Sept. 28, 1874.
3307.—REDWOOD, T. B., Finchley, Middlesex, "Improvements in the manufacture of gas for burning." Sept. 26, 1874.

PATENTS WHICH HAVE BECOME VOID
BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £50 BEFORE THE EXPIRATION OF THE THIRD YEAR.

2926.—VASSARD, A. P., "Improvements in treating liquid sewage and other ammoniacal liquors." Nov. 1, 1871.
2975.—COLE, J., and ABBOTT, W., "Improvements in treating and utilizing sewage and other refuse matter, and in apparatus to be used for this purpose." Nov. 4, 1871.
3023.—GENT, P., "An improved gas-oven for culinary purposes." Nov. 9, 1871.
3045.—HUNT, B., "Improvements in water-meters." Nov. 10, 1871.

The GRAND MEDAL of MERIT at the VIENNA EXHIBITION has been AWARDED to

GWYNNE & BEALE'S PATENT IMPROVED GAS-EXHAUSTERS,

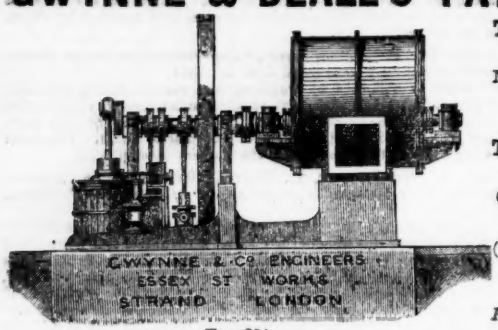


FIG. 224.

The BEST EXHAUSTERS IN THE WORLD.
Made under the personal superintendence of
Mr. BEALE,
The oldest Maker, Inventor and Patentee of
GAS-EXHAUSTING MACHINERY.
(It is NOT CORRECT to state that Mr. BEALE has RETIRED.)

Prices and every information on application.

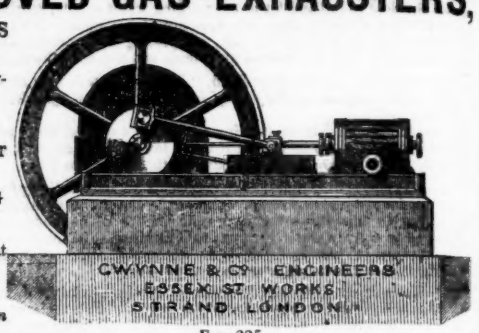


FIG. 225.

Fig. 224 represents one of those erected at the Imperial Gas-Works, Bromley, capable of passing 210,000 cubic feet of gas per hour. Several others of the same size are now on order for the same Company. These Patent Machines combine the highest quality of workmanship and materials, the largest bearings and wearing surfaces, with the **most perfect system of action yet discovered.** Fig. 225 represents one of a series of four at the Nottingham Gas-Works, each passing 52,500 cubic feet per hour. GWYNNE AND Co. *do not pretend to enter into a struggle with other makers in respect to cheapness. They have never sought to make price the chief consideration, but to produce Machinery of the very highest quality, and the most approved design and arrangement.* Their prices have been estimated with a due regard to the **excellence of the article produced,** and when this is taken into consideration, they have no fear for the result. The orders executed this season for Exhausters and alterations to their patented system amount to over 4,000,000 cubic feet of gas passed per hour, and to over 300 horse power for Engines to drive them. In every instance their work is giving the greatest satisfaction. Numerous testimonials and references can be given.

REGULATORS, BYE-PASSES, STOP-VALVES, GAS-VALVES, & MACHINERY FOR GAS MANUFACTURE, OF ALL SIZES,
CAN BE HAD ON APPLICATION TO

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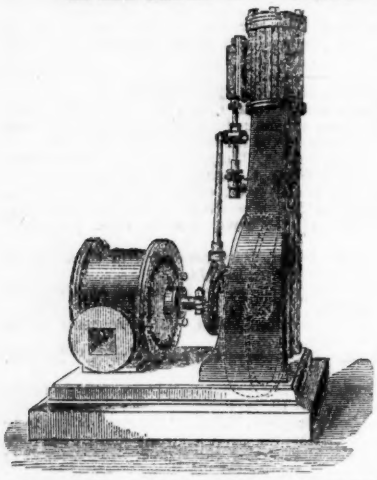
G. & Co. are now manufacturing for a London Gas Company three of their 210,000 cubic feet Patent Gas Exhausters, and many of all sizes.

BEALE'S IMPROVED PATENT GAS-EXHAUSTER



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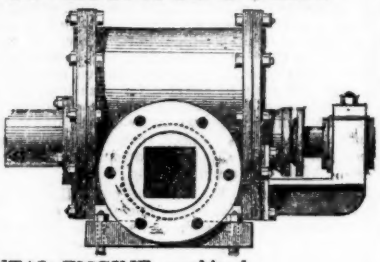
ENGINE COMBINED
ON
ONE BASE PLATE.
SOLE MAKERS,
GEORGE WALLER & CO.,
Who, since Mr. BEALE'S retirement, are the Oldest Makers.



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EXHAUSTERS with OUTSIDE BEARINGS.
MAKERS of ENGINES, BOILERS, and GAS MACHINERY.
TAR, LIQUOR, and SYPHON PUMPS. GAS-VALVES in stock, 2 to 30 inches.
SELF-ACTING BYE-PASS VALVES, with Lid and Relieving Lever.
MANN'S and many other descriptions of WATER DISTRIBUTORS.
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PHŒNIX ENGINEERING WORKS, HOLLAND STREET, S.E., & at STROUD, GLOUCESTERSHIRE.

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WANTED, a second-hand Weigh-BRIDGE, suitable for small Gas-Works. Send particulars to MANAGER, Gas-Works, St. Mary Cray, KENT.

WANTED, to Lease Gas-Works. Size preferred with annual make from 3 to 5 millions. Address No. 112, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

DRAUGHTSMAN.

WANTED, in a Provincial Gas-Work, for about six months, the services of a competent DRAUGHTSMAN.
Apply, stating particulars, to No. 110, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, by a young Man, a situation as METER-FIXER, Fitter, &c. Willing to make himself generally useful.
Address No. 111, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

METER INSPECTOR.

WANTED, by the Brighouse Local Board, a competent Man as GAS-METER INSPECTOR, and Repairer of Wet and Dry Meters. He must be willing, when required, to assist in the laying of gas-mains and services. Wages 29s. per week.
Applications, in writing, to be sent in on or before Thursday, the 10th day of December, addressed to the Gas Committee, Gas-Works, Brighouse.—By order,
JAMES RILEY, Manager.
Brighouse, Nov. 27, 1874.

WANTED, a Gas Engineer, who can prepare estimates, and understands every description of gas-fitting; a good draughtsman indispensable. One who has a connexion amongst architects preferred.
Apply, stating age and where employed, also salary required, to HOUSEKEEPER, 47, Lime Street, LONDON, E.C. None need apply unless fully competent.

WANTED, by the Advertiser, the MANAGEMENT of a medium-sized Gas-Work. Has had 13 years practical experience in the manufacture and distribution of Gas. Can work iron or clay retorts. Is a good fitter, and can produce satisfactory testimonials.
Address No. 102, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, by the Advertiser, an engagement as ASSISTANT MANAGER or Superintendent of a Gas-Work. Has had charge of both building and managing works. Fair draughtsman, with a knowledge of accounts, chemistry, photometer, &c. Can produce testimonials or give references.
Address No. 106, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

ADVANTAGES OF GAS FOR COOKING AND HEATING,
BY
MAGNUS OHREN, A.I.C.E., F.C.S.

For Companies to issue to their gas consumers.
Specimen Copy by post 4d., direct from MAGNUS OHREN, Gas-Works Lower Sydenham, London, S.E.

TO METER MAKERS.

WANTED, in a Provincial Meter Manufactory, a thoroughly practical and competent dry meter maker as FOREMAN.

Apply, by letter, to No. 113, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

GAS MANAGER.

WANTED, in a small Gas-Work, where there are from 5 to 8 retorts in use in the winter and 2 or 3 in the summer, a WORKING MANAGER, who thoroughly understands the making and distribution of gas. He will be required to put up gas-fittings and lay service-pipes, &c. A stoker is kept the greater part of the year.

State wages required, including house, gas, and coal, to No. 114, care of Mr. King, 11, Bolt Court, Fleet Street, LONDON, E.C.

DARLINGTON GAS-WORKS.

WANTED, by the Corporation of Darlington, a MANAGER for the above works.

He must have a thorough knowledge of the manufacture and distribution of gas, and be capable of superintending the erection of new works now in progress.

The present make of gas is about 100 million cubic feet per annum.

Applications, endorsed "Gas Manager," with testimonials or references, stating salary required, and when the applicant can enter upon his duties, to be forwarded to me on or before Wednesday, the 16th of December.

By order,
HUGH DUNN, Town-Clerk.

Darlington, Nov. 26, 1874.

TO CHEMICAL MANUFACTURERS AND OTHERS.
AMMONIACAL LIQUOR.

THE Directors of the Independent Gas-light and Coke Company are prepared to receive TENDERS for the whole of the AMMONIACAL LIQUOR produced at their works at Haggerston, to commence on the 1st of January, 1875.

Particulars and forms of tender may be obtained on application to Mr. Laing, the Engineer, on the works.

The same must be sent in to me, on or before Friday, the 4th of December, endorsed "Tender for Ammoniacal Liquor."

By order,
JAMES B. COULSON, Secretary.

236, Kingsland Road, Nov. 17, 1874.

CORPORATION GAS-WORKS, DARLINGTON.

TO ENGINEERS, IRONFOUNDERS, &c.

THE Gas Committee of the Darlington Corporation invite TENDERS for the following extensions of their works, each Contract to be tendered for separately.

1. For the supply and erection of a TELESCOPIC GAS-HOLDER, 100 ft. diameter and 50 ft. high, with columns, guides, girders, &c., complete.

2. For the supply and fixing of the whole IRONWORK required for a Tramway, and consisting of columns, girders, turn-tables, &c., to be erected in a Retort-House, now being built.

3. For the supply of the following GAS-MAINS, which are to be coated, and turned and bored for jointing:—

600 yards	. . .	12-in. diameter.
1500 ,,	. . .	6-in. ,,
400 ,,	. . .	8-in. ,,
300 ,,	. . .	3-in. ,,

Drawings and specifications may be seen at the Engineer's Office, Gas-Works, Darlington.

Tenders, endorsed, to be sent to the undersigned, not later than the 14th of December inst.

The lowest or any tender not necessarily accepted.

By order,
W. B. EMMERSON, Engineer.

COST PRICE SHEETS.

MANUFACTURE AND DISTRIBU-TION OF GAS. These sheets are the same as were laid before the Dublin Meeting of the British Association of Gas Managers; but in the REPRINT, NOTES have been added for the guidance of those using them. Copies of the two sheets may now be had, price 5s.

South Shields. W. J. WARNER.

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WILLIAM RICHARDSON,

GAS AND HYDRAULIC ENGINEER,

93 & 94, CHARLES HENRY ST., BIRMINGHAM.

IMPERIAL CONTINENTAL GAS ASSOCIATION.

The HALF-YEARLY ORDINARY MEETING of the Imperial Continental Gas Association was held at the City Terminus Hotel, Cannon Street, London, on TUESDAY, the 24th inst.

Proposed by Mr. Thomas Henry Goodwin Newton, and seconded by Mr. Joseph Sebag—"That Mr. Julian Goldsmid, M.P., do take the chair."—Carried unanimously.

Mr. Julian Goldsmid, M.P., thereupon having taken the chair,

The following Resolutions were passed:—

Resolved unanimously—"That the report upon the affairs of the Association now read be received, adopted, and entered on the minutes."

Resolved unanimously—"That a dividend of £1 15s. per share be declared upon the 56,000 shares of the Association, for the half year ending the 30th of June last; and that the said dividend be payable, free of income-tax, on and after the 15th of December next."

"That the cordial thanks of the meeting be given to the President and Directors for their able management of the affairs of the Association, and to the Chairman for his conduct in the chair this day."

Upon the motion of the Chairman, a vote of thanks was also given to Mr. G. W. Drory, the General Superintendent of the affairs of the Association on the Continent, and to the Agents, Engineers, and other Officers of the Association.

By order of the Board of Direction,
ALBERT F. JACKSON, Secretary.

30, Clement's Lane, Lombard Street, London,
Nov. 25, 1874.

MIDDLESEX.

GAS AND GAS-METER COMPANIES SHARES.

TO CAPITALISTS, TRUSTEES, AND OTHERS SEEKING SOUND INVESTMENTS.

MR. F. W. SEARLE has been favoured by instructions to SELL by AUCTION, at the Lecture Hall, High Road, Tottenham, on TUESDAY, Dec. 8, 1874, at Six for Seven o'clock in the evening, 150 SHARES, fully paid up, in the sum of £5 each, in that successful and firmly established undertaking, the Tottenham and Edmonton Gaslight and Coke Company; also 10 Shares of £100 each, and fully paid up, in that prosperous undertaking the Gas-Meter Company, Limited.

Particulars, with conditions of sale, and any further information, may be obtained of F. W. SEARLE, Surveyor, and Auctioneer, TOTTENHAM and ENFIELD.

WATER-MAINS.

COTTERILL'S PATENT STEEL TUBE-DRILLS, for connecting services to water-mains, *under pressure*, without turning off the water. They drill and tap themselves, and are left in the mains. Made of all sizes, from ½ to 2 inches and upwards. They cost less than the ordinary plan.

Apply to CHARLES FORSTER COTTERILL, Cannock, STAFFORD. Patentee.

A. C. FRASER, of 16, St. Swithin's Lane, E.C., who for 20 years has been engaged in the construction and management of works, may be consulted at the above address on all matters relating to Gas and Water Supply.

Plans, specifications, and estimates furnished. Patent Ribbed Retorts, Fire Goods, and Fittings of every description on moderate terms.

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Advises on all matters connected with the Distribution of Gas, Public Lighting, Gas Testing, &c.

Valuations made for Assessment and other Purposes.

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60, CORNHILL, LONDON, E.C.,

Is prepared to open the Books, and, if necessary, keep the Accounts of Gas and Water Companies.

To examine the Books and Accounts, and prepare Balance-Sheets for the information of Directors.

To assist Secretaries in preparing Balance-Sheets, according to the "Gas-Works Clauses Act, 1871;" or may be consulted with respect to Accounts generally.

WM. RICHARDS,

INVENTOR OF THE DRY GAS-METER,

REVISER OF "HUGHES ON GAS-WORKS,"

CONSULTING GAS ENGINEER,

Advises on all matters of business connected with Gas Lighting. Furnishes Working Drawings of Retort-Settings, Specification of Works, complete or in detail.

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GAS COMPANIES ACCOUNTS.

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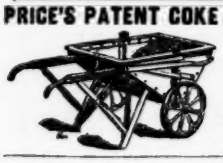

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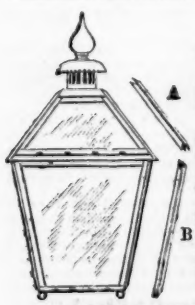

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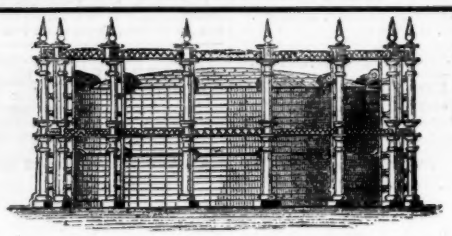

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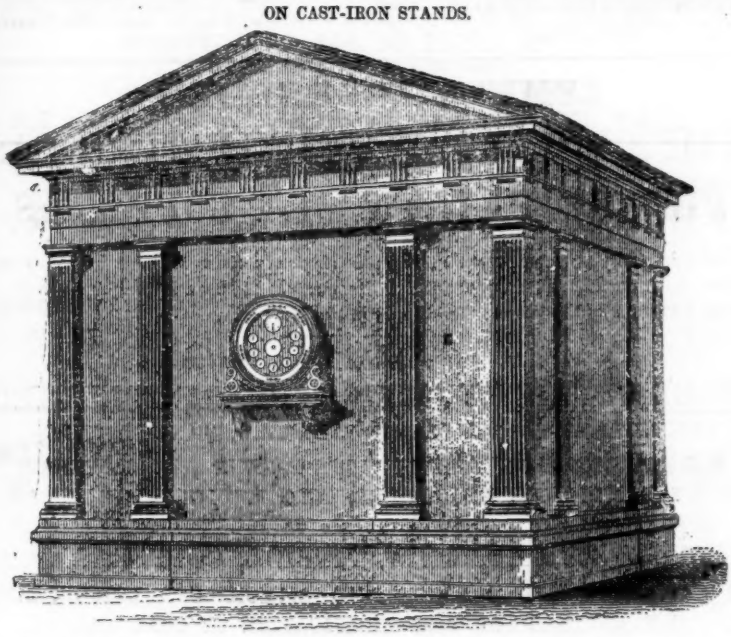

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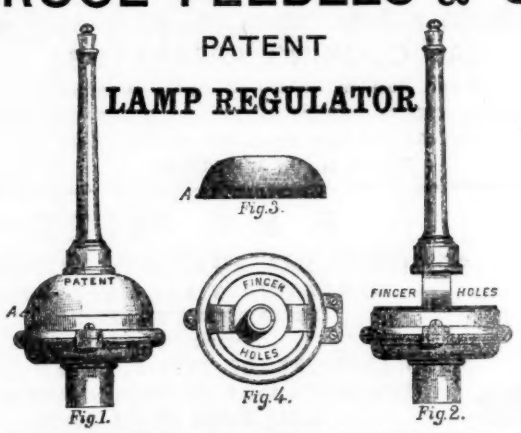

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Analysis by F. J. EVANS, Esq., Chartered Gas Company, Horseferry Road, Westminster:—

(COPY.)

	Cubic Feet of Gas per Ton of Coal.	Illuminating Power in Candles.	Coke per Ton of Coal used.	Ash in Coke, per Cent.	Sulphur in Coal, per Cent.
Silkstone Nuts . . .	10·800	15·85	12·66 cwt.....	6·0	·69

NOTE.—The illuminating power of the gas was tested by the standard burner now used in London by the Gas Referees, under the City of London Gas Act, 1868.

Horseferry Road, Westminster, March, 1870. (Signed) F. J. EVANS.

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